THE DEVELOPMENT OF AI CHATBOT FOR KAMPAR TOURISM MOBILE APPLICATION

By

Ngui Miew Yiong

A REPORT

SUBMITTED TO

Universiti Tunku Abdul Rahman

in partial fulfillment of the requirements

for the degree of

BACHELOR OF INFORMATION TECHNOLOGY (HONS)

COMPUTER SCIENCE

Faculty of Information and Communication Technology
(Kampar Campus)

JUNE 2020

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DECLARATION OF ORIGINALITY

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Name : Ngui Miew Yiong

Date : 10/9/2020

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ABSTRACT

Nowadays, a lot of useful and important data wasted in tourism sector throughout years all around the world. Although people understand the importance of data in the tourism industry, there is still lack of technology and methods for collecting those important tourist data, thus caused a lot of economic losses all around the world.

AI Chatbot is a computer program developed by human that act like a real human being which can communicate with user. In other word, AI Chatbot can be said as a conversation agent that can communicate with user by using natural language. As technology advanced, AI Chatbot become more and more popular in many areas such as e-commerce, online banking, online shopping and etc. Although there are AI Chatbot used in travel guide system, it is still not enough functions to satisfy tourist.

KamparBot is an AI Chatbot, which is also a part of features of GoKampar travel guide Application. It allows users to find and search for café, restaurant, hotel and attractions when travelling in Kampar. Not only that, compare with traditional travel guide applications, KamparBot provide more convenience features for users to use the GoKampar travel guide Application.

Some strengths and weaknesses of existing Travel Guide Application will be discussed in this report. Methodology and technologies used to improve the performance of AI Chatbot of GoKampar travel guide application will also be discussed in this report. Finally, some testing result will be shown in this report.

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LIST OF ABBREVIATIONS

AI	Artificial Intelligence
AIML	Artificial Intelligence Modelling Language
API	Application Programming Interface
etc	Et cetera
HTTP	HyperText Transfer Protocol
HTTPS	HyperText Transfer Protocol Secure
IT	Information Technology
XML	eXtensible Markup Language
COVID-19	Coronavirus Disease 2019

Chapter 1: Introduction

In this chapter, the problem statements, objectives, motivation, project scope and the contribution of this project is listed here.

1.1 Problem Statement and Motivation

Nowadays, there are still some existing problems in Malaysia's tourism and travel application. The problem including:

- **Less functionality of AI Chatbot in tourism sector**

  Most of the travel apps applied AI Chatbot for customer service only but no other services like check weather, search place, route place and rate place. There is still lack of use of AI Chatbot as a main function in travel app.

- **Data wasting**

  Although many tourism industries in Malaysia retain tourist data, they still don't know how to use it effectively for future analysis, even they understand how important these data are. This causes huge amount of important data and information wasted in Malaysia tourism.

- **Lack of attractiveness and interactivity**

  Nowadays, a lot of existing travel apps and websites in Malaysia failed, not because of bad quality, but because of user lack of interest to the common function and process. Users need to search for many places to get their desired place, clicking on the same interface layout to look for other places and keep repeating these processes. This may cause the user to give up the process halfway through. The process of repeating searching and displaying only are very boring.

The aim of this project is to improve the function of Kampar travel app, meanwhile collect tourist data for future analysis using voice-activated AI Chatbot. Although Malaysia tourism attracted many visitors and investors, there is still a lot of useful and valuable data in tourism sector being wasted every year. By analyze tourist data, tourism industries and some other related business can adapt their businesses to follow tourist trend and perform strategy to fit the tourist's behavior. These data are valuable in lots of different fields of business nowadays. GoKampar is an application that promote Kampar tourism industries and collect visitor data for analysis. AI Chatbot is one of the features in this application, which allow users to search restaurant, hotel, attraction and etc. and also navigation services. By implementing Voice Recognition feature into the AI Chatbot, the functionality of GoKampar increases as users only need to press a button and speak out their requests to get what they want. For traditional travel app, they may provide lots of services but users may lose interest if they have to keep repeating access multiple layouts to get what they want but if using voice-activated AI Chatbot, all they need to do is just asking. In conclusion, the voice-activated AI Chatbot can improve the function of GoKampar and also collecting tourist data for future analysis.

1.2 Project Scope

The purpose of this project is to develop a new feature which is Voice Recognition for the existing AI Chatbot, KamparBot in GoKampar app to become a voice-activated AI Chatbot. This voice recognition feature focuses on making GoKampar more convenient for users. Users are able to search places, chat and get navigation service from the AI Chatbot through speaking. Not only that, this voice-activated AI Chatbot can detect the weather condition and provide appropriate choices for users. The main area covered by the voice-activated AI Chatbot is tourist information. This voice-activated AI Chatbot covers most of the basic needed functionality that provided in traditional tourism app and also some additional functionality to support the GoKampar app. The development also focuses on the data collection, weather information collected while choosing best choice for users, and user behavior collected through conversation or provided services. The collected data is stored into a cloud database which called as “Firebase” and is ready for future analysis. The targeted data that needed to collect in this project is tourist behavior, where is their favourite places, how they travelling in Malaysia, and how they act when facing various weather condition like rainy day and sunny day. These data are very important for us to do future analysis. Some of the hidden information about tourist can be evaluated from these data. This project also helps to increase the attractiveness and usability of the GoKampar app.

1.3 Project Objectives

- **To simplify and increase the functionality of travel app**

  In traditional travel app users have to keep repeating navigate multiple layouts for searching what they looking for but with KamparBot, they can just simply ask with voice or chat by messages. Asking with voice or chatting with messages is a simple way for users to search places and its information. All the services and functions will be conducted in a chat box.

- **To collect tourist data easily**

  Tourist's data act as an important asset for Malaysia tourism industry, thus preserving the data is needed to be done now. KamparBot will collect user's data when the user uses the services of the app. Those collected data including common messages user used, user's favourite places information and their behaviour on travelling in Kampar.

- **To improve the attractiveness of travel app**

  Traditional travel app provides many services but almost all of them are the same, making users feel boring to use it. KamparBot have provided interactivity functions and layouts for users to get their desired information by simply asking with voice or chatting instead of keep clicking on the display. This brings users a sense of freshness toward the travel app.

1.4 Impact, Significant and Contribution

In this project, the tourist data are collected for future use and analysis. Nowadays, tourist data has become one of the most valuable assets all around the world. It is clearly to observe that nowadays lots of the business are using “Big Data” concept to improve their company. Companies which make full use of the collected data, improving their business based on these data, are easier to success. The data collected in this project can provide necessary and useful information for Malaysia tourism industry, making tourism industry in Malaysia become more advanced.

Not only that, the features of KamparBot also improve the usability and attractiveness of the GoKampar mobile application. A voice-activated AI Chatbot which brings freshness and convenience towards users is better than a traditional travel app which provide only common functions. If more users use GoKampar, more visitors will know Kampar and travel to Kampar. If more visitors travel to Kampar, the reputation of Kampar will rise and also the raise of economy of Kampar.

1.5 Background Information

Nowadays, Chatbot becomes more and more popular in the IT sector as most of the business use AI Chatbot technique for education purpose, online customer service, and also some entertainment. This technique brings a big contribution towards science and technology. According to Expert System Team, AI Chatbot is an Artificial Intelligence (AI) software that can simulate a conversation (or a chat) with a user in natural language through applications. In other word, AI Chatbot can be said as a virtual agent (not a real human) that can interact with users with natural language. Google Assistant, Siri and Cortana are some popular success Chatbot in the market nowadays.

Artificial Intelligence Markup Language (AIML) is one of the languages used in the development of Chatbot. AIML is an XML base language that used to create AI Chatbot. AIML is commonly used in Chatbot development because it cost less and easy to configure.

Another important thing in this project is data mining. Data mining, also can say as data collection, is a very important process in this project. Data mining is defined as a process to collect usable data from large set of row data. Through data mining process, businesses can learn more about their customers and develop more effective strategies to improve their business. Data collected through data mining can be use for future analysis also.

1.6 Report Organization

The details of this project are shown in the following chapters. Chapter 2 reviewed some existing applications and technologies used in this project. Chapter 3 presented all system design diagrams of this project. Chapter 4 describes tools, technologies and methodology used in this project. Chapter 5 listed out the system functional and non-functional requirement of this project. Chapter 6 shows the user interface of proposed application with simple description. Chapter 7 shows system implementation and testing results. Chapter 8 displays some analysis data and conclusion of this project.

Chapter 2: Literature Review

2.1 Existing Application Review

2.1.1 Snaptravel

Snaptravel is a mobile application that allows user to search and book hotels all around the world. It also provides a lots of great deal hotels for users to find and book. Not only that, it also provides some service like adjust budget and AI Chatbot. User can directly ask AI Chatbot to provide some specific hotels with travelling date. The AI Chatbot will provide the information about those hotels and special offers or great deals on the given travelling date. Users can also adjust their budget and Snaptravel will help them to search hotels that meet their target budget.

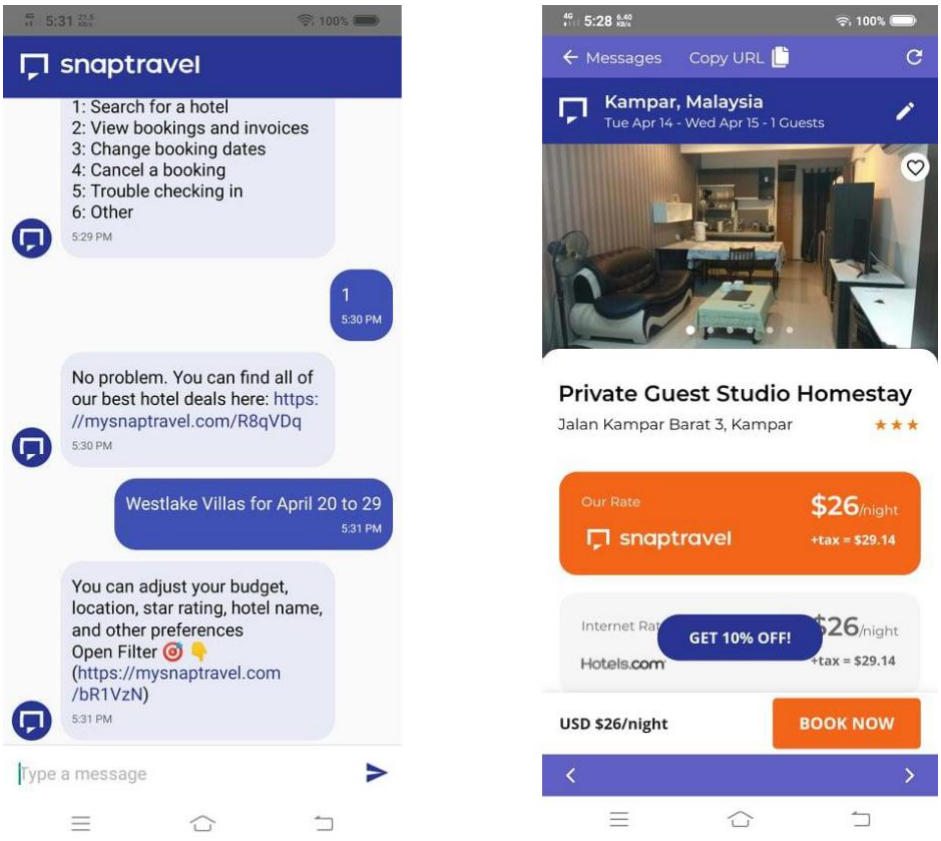

Figure 2.1 Screenshots of Snaptravel 1

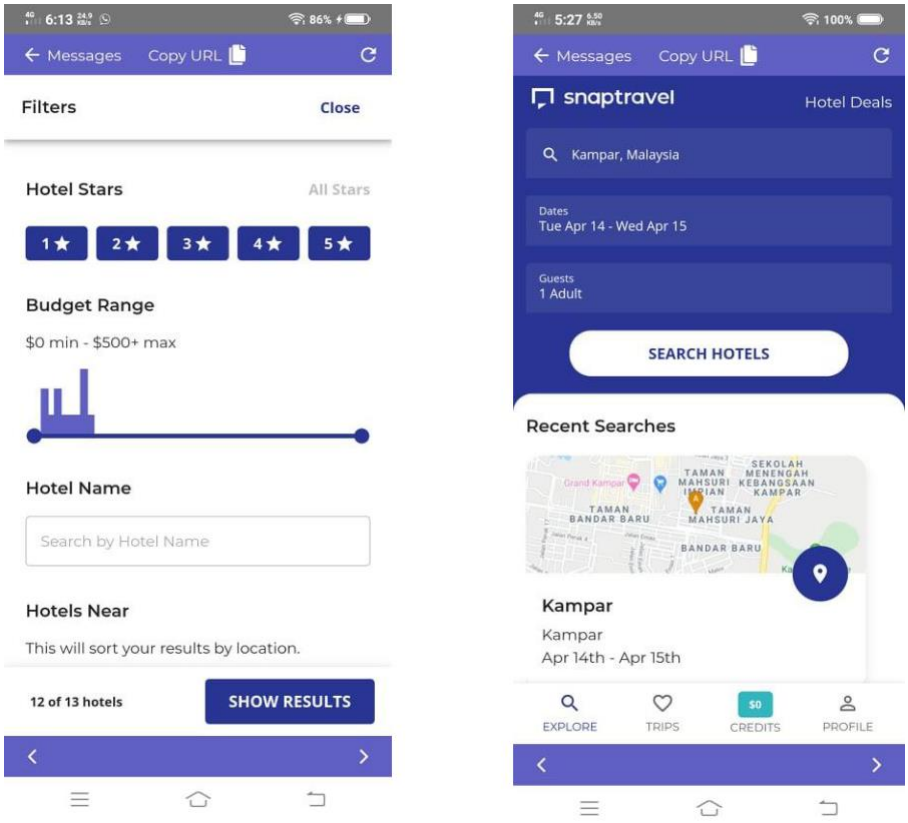

Figure 2.2 Screenshots of Snaptravel 2

Strengths

User friendly, provide a lot of information if users are new to this app.

Can search hotels all around the world.

Provide lots of great hotel deals for users booking hotel.

Collects user behavior when user perform a search, allow users to refer back their recent search data.

Allow users to adjust budget to find and book hotel.

Weaknesses

Always give irrelevant answer, reply of Chatbot sometimes not accurate.

Very limited input, reducing interactivity of Chatbot.

Gives only website link to access the search functions, if the Chatbot does not provide website link, user cannot do anything.

Malfunctioning of Chatbot may occurs sometimes.

2.1.2 Expedia

Expedia is a mobile application that help user to find hotels, flights and also car rental deals. Expedia also provide bundle deals, which include hotel, flight and car for rental for user to arrange their travel plan easily. It also uses AI Chatbot to provide customer services for users to check booking details. The AI Chatbot also allow user to change or cancel their booking if they wish to. User also can contact real agent (human) through this AI Chatbot.

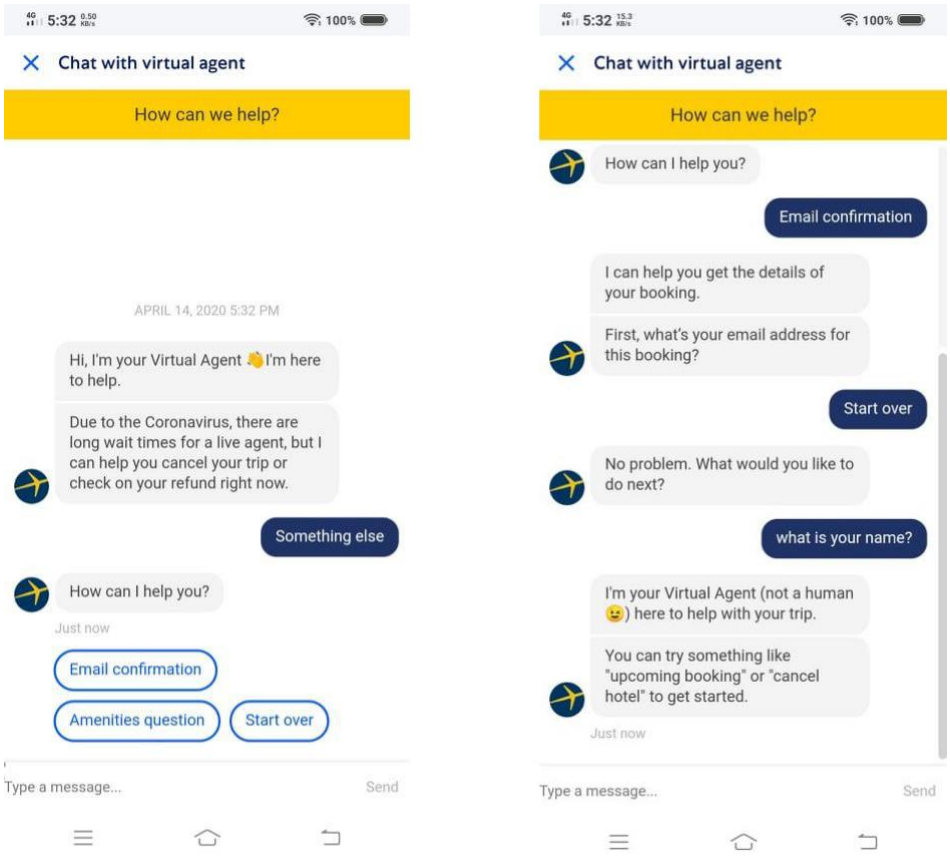

Figure 2.3 Screenshots of Expedia 1

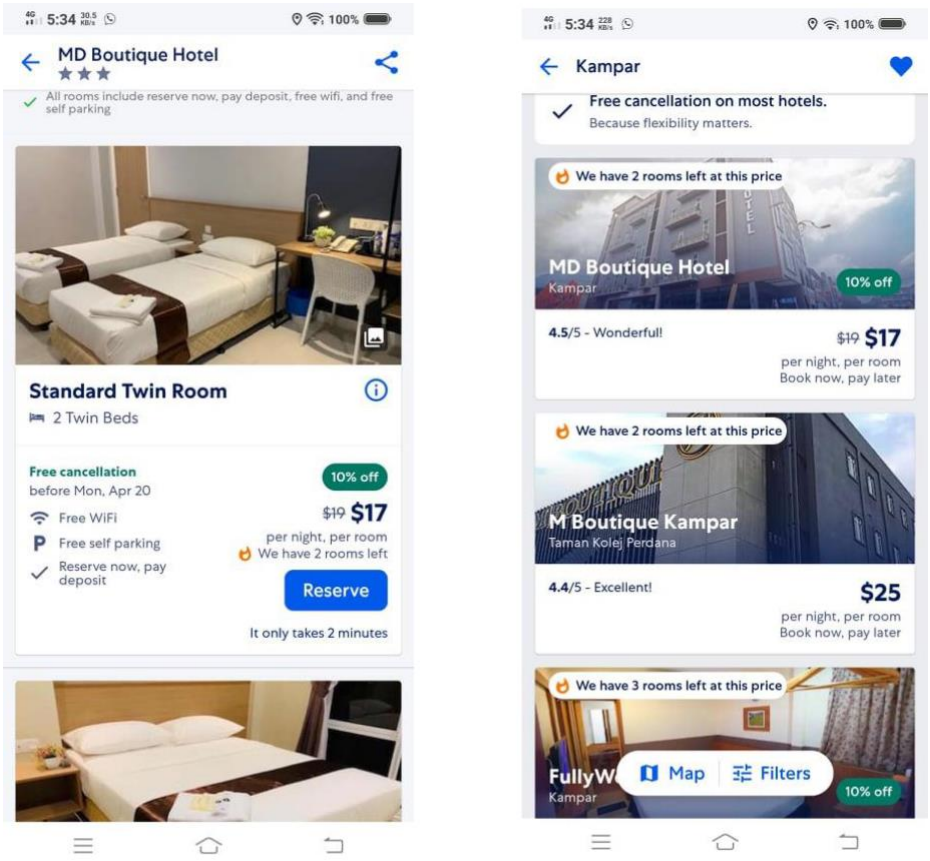

Figure 2.4 Screenshots of Expedia 2

Strengths

User friendly, provide shortcut answer for new users to use the Chatbot easily.

High security on check booking details as user need to provide their email in order to check.

Provide very clear information about hotels, flights and cars.

Have nice user interface layout.

Weaknesses

Limited services provided by Chatbot. Some services can only be done by real agent.

Not very convenience as user need to register an account in order to use this app.

Reply of Chatbot not very accurate and may provide irrelevant answers.

2.1.3 JAPAN Trip Navigator

JAPAN Trip Navigator is a travel guide mobile application developed by Japan. This application provides a Chatbot, named as Miko, for their users to search any information that they wanted to know about Japan. Through Miko (Chatbot), users can search for places, news and events easily. For example, user ask Miko “Show me top rated restaurant”, then Miko will list out some suggestion restaurant for user to choose. User also can choose to look for more other information. Not only that, new user can press on the top right “How to use” button to learn and use this app easily. That button provides lots of shortcut messages for user to use.

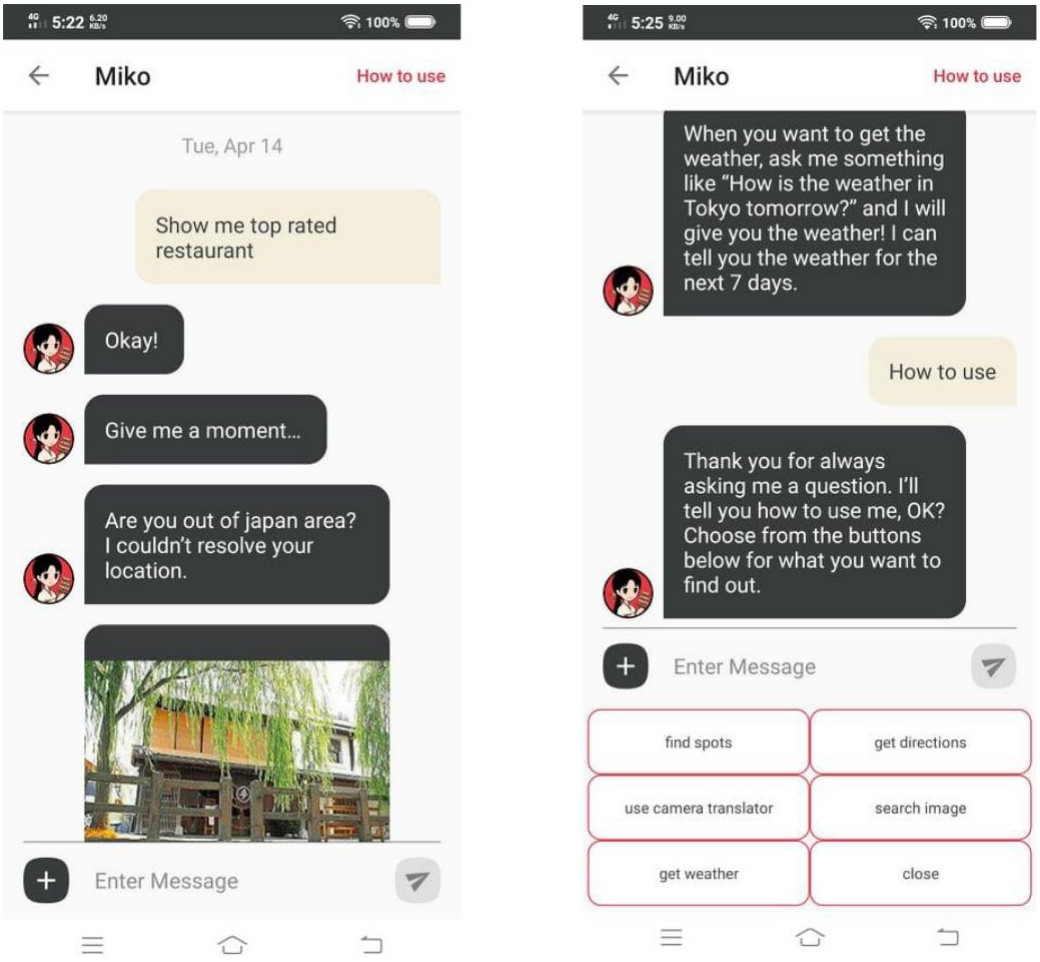

Figure 2.5 Screenshots of JAPAN Trip Navigator 1

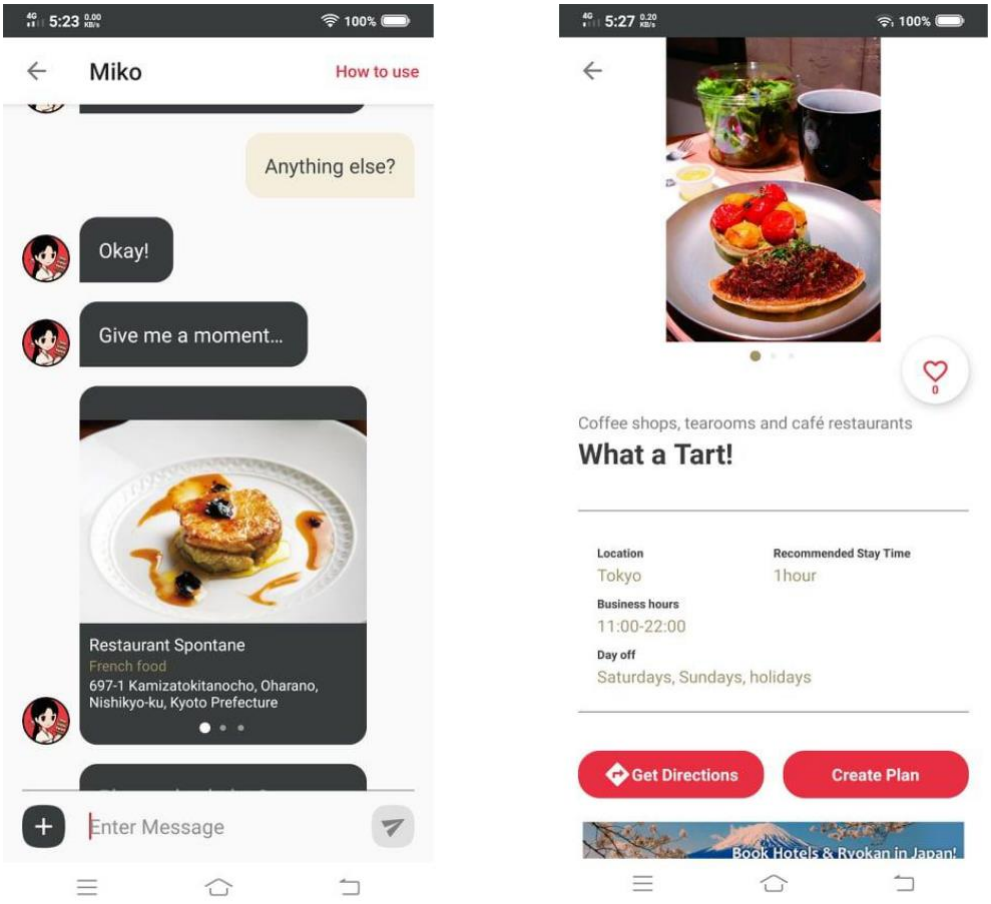

Figure 2.6 Screenshots of JAPAN Trip Navigator 2

Strengths

High interactivity, like talking to a human.

Easier on searching information by giving only some keywords.

Have image processing function, user can upload food photo and Miko will search for them.

Provide clear and sufficient information, including news and events.

Weaknesses

Lack of own route function, need third party application to use the route function.

Limited to Japan area only, cannot search for other country's information.

Shows only recommended places, cannot look for some normal places.

2.1.4 Go Bentong

Go Bentong is a mobile application developed for Bentong which provide Bentong's information, including food, news, events, attraction places and entertainments. User can view the details and information about a place in Bentong through this app easily. User also can set their favorite places and share their photos to their friends through social media application such as Facebook, WeChat and Instagram. It also provides a filter service for user to search their desired place in Bentong easily.

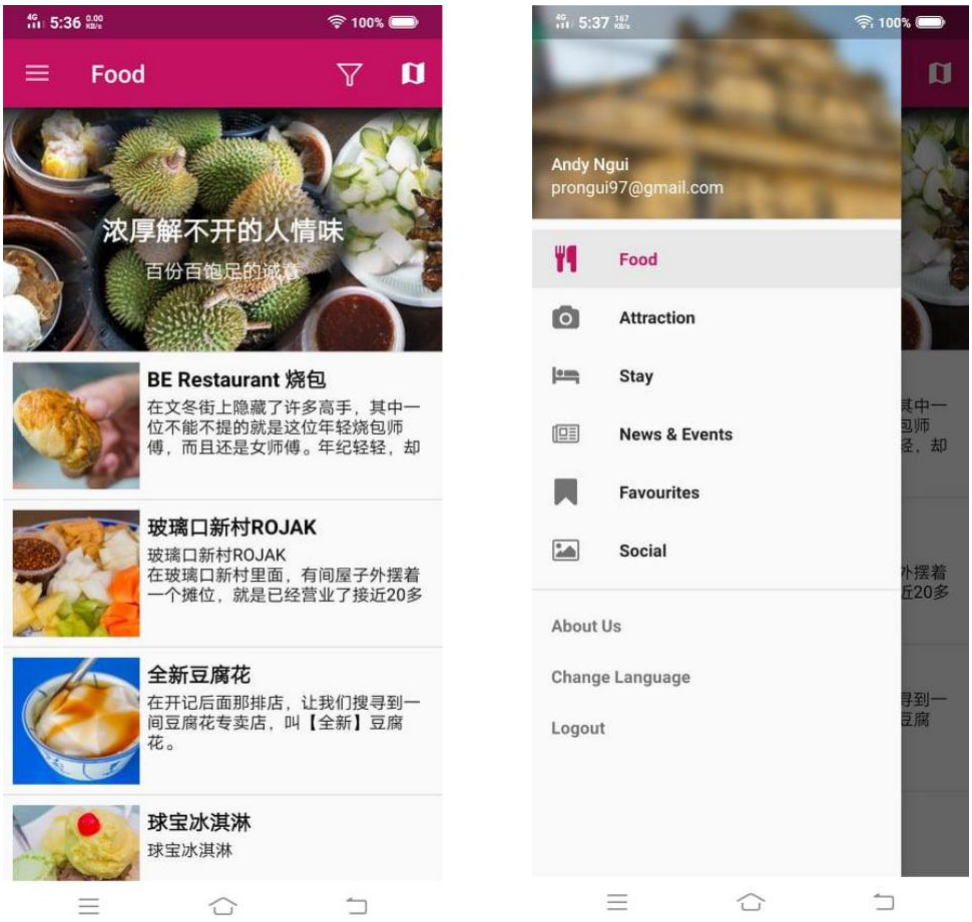

Figure 2.7 Screenshots of Go Bentong 1

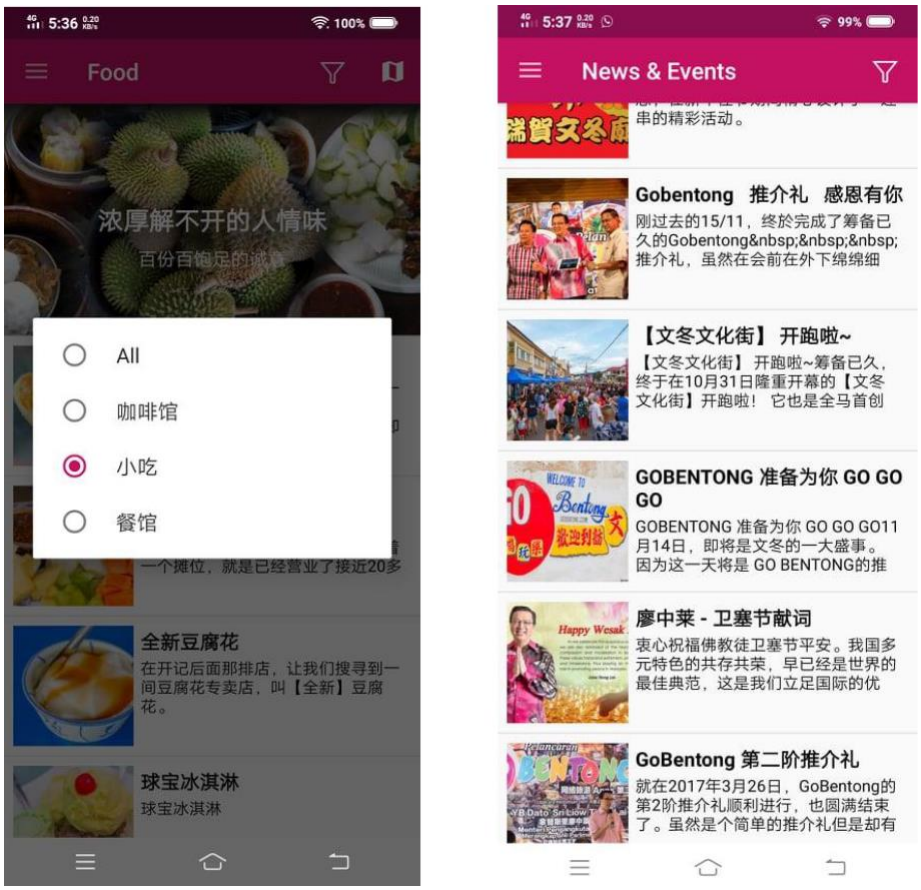

Figure 2.8 Screenshots of Go Bentong 2

Strengths

Simple and clear user interface, information clearly showed.

Provide language switching between Chinese and English.

Provide share functions for user to share happiness and also promote the place.

Provide latest news and events in Bentong.

Provide filter function for user to search easily.

Weaknesses

Poor interactivity and attractiveness as only traditional way to click, show and display information.

No search function for user to search specific place or information.

Lack of own route function, need third party application to use the route function.

Some information does not update for a long time already.

Upload photo function not working anymore.

2.1.5 Comparison between existing applications and proposed application

Apps / Features	Snaptravel	Expedia	JAPAN Trip Navigator	Go Bentong	KamparBot (Proposed Application)
Application Type	Mobile/ Website	Mobile App	Mobile App	Mobile App	Mobile App
Require Internet?	Yes	Yes	Yes	Yes	Yes
Covered Area (Type)	Global (Hotel)	Global (Hotel, Flight, Car rental)	Japan Only (All)	Bentong Only (Entertainment, Hotel, Restaurant, Café)	Kampar Only (Hotel, Restaurant, Café)
Travel Information	Poor	Good	Excellent	Good	Excellent
Require 3rd party route function?	Yes	Yes	Yes	Yes	No
Have Chatbot?	Yes	Yes	Yes	No	Yes
Performance of Chatbot	Poor	Good	Excellent	-	Excellent
Voice activated?	No	No	No	No	Yes
Data Collection	No (surmise)	Yes	Yes (surmise)	No	Yes

Table 2.1 Comparison between existing applications and proposed application

2.2 Use Cases of AI Chatbot in Tourism

AI Chatbot is a program that can imitating human conversation by Artificial Intelligence technology and is a mobile assistant of user with predictive and analytical function. Therefore, to ensure the usability of Chatbot, developer must and need to understand clearly the use cases of AI Chatbot in Tourism and figure out what kind of use cases needed to focus the most.

2.2.1 Personalized Digital Travel Assistant

Chatbot should be able to recognize particular user queries, requests or words immediately and then based on it to search and filter out the most suitable choice to users. Not only that, Chatbot should be able to prevent users conducting long surveys with limited reply options only because this will decrease the interactivity of Chatbot when user using it. Moreover, Chatbot should also be able to provide lots of services like hotel and restaurant recommendations, transportation, and places or attractions to visit.

2.2.2 Local Insider

Most travellers like to travel around foreign places for authentic experience. They want to live, eat, entertain and relax as the locals do. Chatbot should be able to treat travellers as a resident all the time. Chatbot should based on the local review and recommendation to provide nearby places instead of showing only recommended famous places.

2.2.3 Reservation Agent

Chatbot should be able to provide reservation services to users such as book airline tickets, book hotel rooms and car rentals. Chatbot should provide better and more interactive customers experience and services to users when comparing to apps and websites. It should be able to let users to feel like communicating with human operator.

2.3 Web Speech API vs Google Speech-to-Text API

2.3.1 Web Speech API

Web Speech API is a W3C supported specification that allows web developer to provide a speech-to-text service on their web browser. This API can support both server-based and client-based recognition and synthesis. Users can use this API directly from the browser without worrying about API limits. This API mainly focus on web browser platform.

2.3.2 Google Speech-to-Text API

Google Speech-to-Text API is a cloud-based solution that allows users to use Google speech recognition service outside of a browser. It can recognize over 120 languages and automatically recognize languages. This API has multiple machine learning models for increased accuracy. However, Google Speech-to-Text API is not totally free. Although it is not free, but it is free for speech recognition service for audio less than 60 minutes per month.

2.3.3 Comparison Table between Web Speech API and Google Speech-to-Text API

Characteristics	Web Speech API	Google Speech-to-Text API
Difficulty of use	Complicated	Simple and Easy
Type of retrieved data	Java Object	JSON or XML
Limitation of request	No limit	Limited
Data flexibility	Medium	High
Cost	Free	Free for 60 minutes audio trial

Table 2.2 Comparison between Web Speech API and Google Speech-to-Text API

Web Speech API is more complicated to use compared with Google Speech-to-Text API but has no limit in limitation of request while Google speech-to-Text API has limits. Google Speech-to-Text API is not totally free but has higher data flexibility compared with Web Speech API. The final decision is using Google Speech-to-Text API to recognize voice and get results

from Google Cloud platform. The reason is because this project mainly focus on android application platform so using Google Speech-to-Text API is more suitable than Web Speech API.

2.4 Cloud Database using Firebase

Cloud database is a database service that can be built and accessed through cloud platform. It plays an important role in this project as it able to store all collected data into a cloud server instead of store into a physical server. As all the data are stored into cloud server, developer can no need to implement server-side programming to store data as all the scripts are running on the cloud server, thus making the development faster, flexible and easier. Firebase is one of the famous cloud databases nowadays that allow developer to store their data into Google Cloud database with NoSQL and is free to use. The type of data stored is JSON and is real-time synchronize.

Before using Firebase, developers need to know the minimum API level that Firebase can support and also the minimum Gradle version. Not only that, developers need to create a Firebase Google account and create a new Firebase project to develop their app. Developers also need to add some configuration settings into their app and also the Firebase Project. Lastly, developers must add the Firebase SDK into their developed app in order to use Firebase services. All the instructions and services are clearly stated in Firebase guideline.

Chapter 3: System Design

3.1 Use Case Diagram

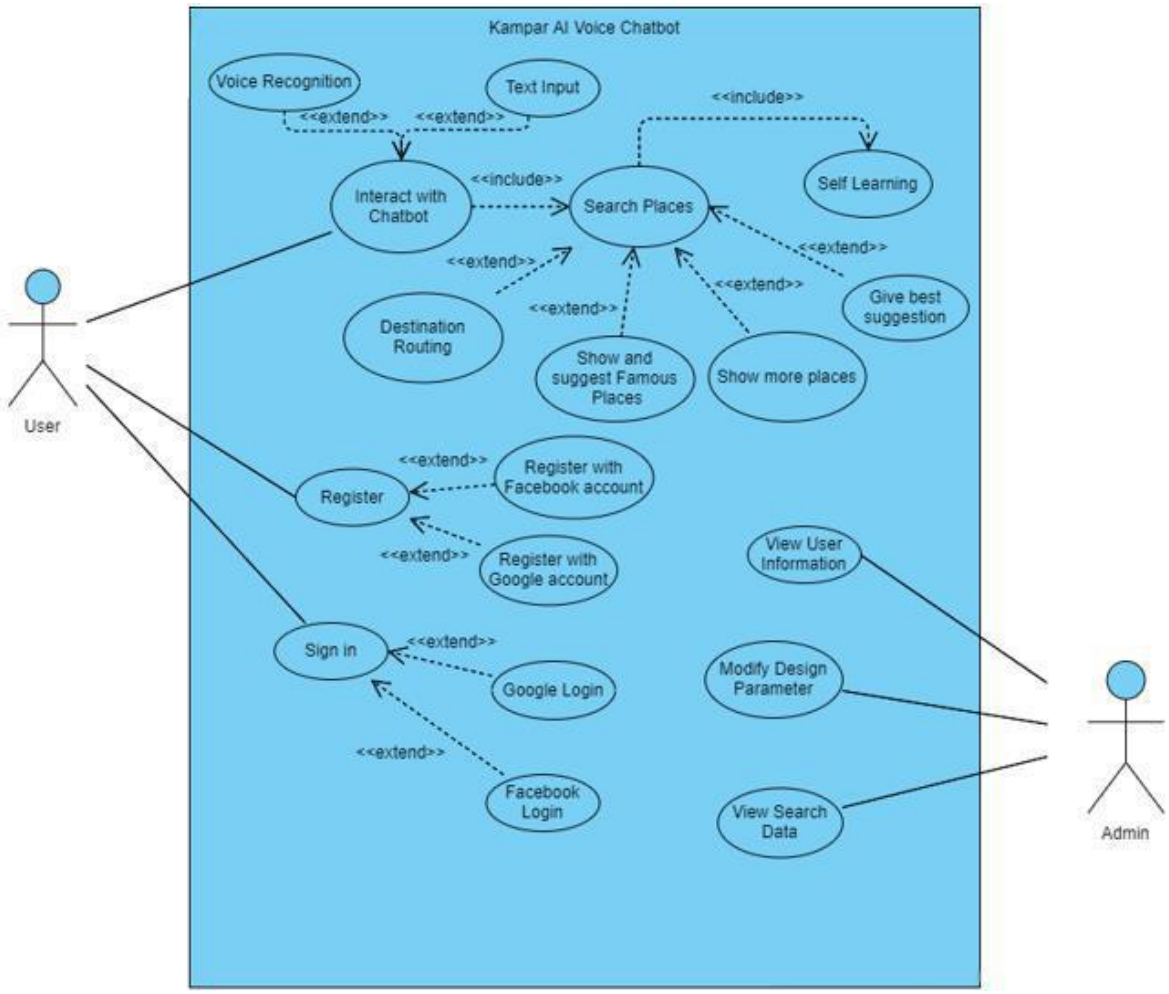

Figure 3.1 Use Case Diagram

3.2 Flow of Events

3.2.1 Sign Up

Normal Flow

1. User click on the Sign-Up link and enter into sign up page.
2. User enters username.
3. User enters Email.
4. User enters password.
5. User enters password again to confirm password.
6. User click on sign up button.
7. System send a verification email to user.
8. System ask user to verify their account first before sign in.

Alternate Flow

3a System displays error message if email not valid.

4a System displays error message if password not valid.

5a System displays error message if password is not match.

6a System displays error message if the sign-up process failed.

3.2.2 Sign In

Normal Flow

1. User enters Email.
2. User enters password.
3. User click on Login button.
4. System direct the user to Chatbot main page.

Alternate Flow

3a System displays error message if the Email is not valid or password is incorrect.

3.2.3 Facebook Login

Normal Flow

1. User click on the Facebook login button.
2. System displays Facebook login page.
3. User enters Email or Phone number.
4. User enters password.
5. User agree with Facebook login confirmation.
6. System direct the user to Chatbot main page.

Alternate Flow

5a System display error messages and terminate login session if user cancel the confirmation.

6a System display error messages and terminate session if login with Facebook failed.

3.2.4 Google Login

Normal Flow

1. User click on the Google login button.
2. System displays Google account login page if no Google account presented, otherwise system displays Choose a Google account login page.
3. User select a Google account to continue login or enter Email and password.
4. System direct the user to Chatbot main page.

Alternate Flow

4a System display error messages and terminate session if login with Google failed.

3.2.5 Communicate with Chatbot (text)

Normal Flow

1. User enters message.
2. User click on send button.
3. System pass the message to Watson API.
4. System receives reply from Watson API.
5. System displays the reply message.

Alternate Flow

4a System failed to receive response from Watson API and terminate session.

3.2.6 Communicate with Chatbot (voice)

Normal Flow

1. User click on the voice button and speak.
2. System receives the voice from user and pass to Google Speech-to-Text API.
3. System receives the result and pass the result to Watson API.
4. System receives reply from Watson API.
5. System displays the reply message.

Alternate Flow

3a System failed to receive response from Google Speech-to-Text API and terminate session.

4a System failed to receive response from Watson API and terminate session.

3.2.7 Search Places

Normal Flow

1. User enters search message with text or voice.
2. System pass the message to Watson API.
3. System receives reply from Watson API.
4. System verify the type of searched places and search for most suitable places based on tags and distances.
5. System obtain the search results and displays the recommended places to user.

Alternate Flow

3a System fail to receive response from Watson API and terminate session.

4a System detects new tag and call the Word Associations API to compare the new tag and existing tag.

4b System replaces the new tag to existing tag if the new tag is associated with the existing tag.

5a System failed to find a result, displays "No results" message and terminate session.

3.2.8 Route to Destination

Normal Flow

1. User enters search message with text or voice.
2. System pass the message to Watson API.
3. System receives reply from Watson API.
4. System verify the type of searched places and search for most suitable places based on tags and distances.
5. System obtain the search results and displays the recommended places to user.
6. User click on the "Route me to Destination" button.
7. System pass the longitude and latitude of the place to Google Map Navigation.
8. Google Map Navigation route user to the destination.

Alternate Flow

3a System fail to receive response from Watson API and terminate session.

4a System detects new tag and call the Word Associations API to compare the new tag and existing tag.

4b System replaces the new tag to existing tag if the new tag is associated with the existing tag.

5a System failed to find a result, displays "No results" message and terminate session.

8a Google Map failed to route to destination if the longitude and latitude provided is invalid.

3.2.9 View More Places

Normal Flow

1. User enters search message with text or voice.
2. System pass the message to Watson API.
3. System receives reply from Watson API.
4. System verify the type of searched places and search for most suitable places based on tags and distances.
5. System obtain the search results and displays the recommended places to user.
6. User click on the "Looking for More" button.
7. System displays a list of similar places.

Alternate Flow

3a System fail to receive response from Watson API and terminate session.

4a System detects new tag and call the Word Associations API to compare the new tag and existing tag.

4b System replaces the new tag to existing tag if the new tag is associated with the existing tag.

5a System failed to find a result, displays "No results" message and terminate session.

7a System displays "No results" message if there is no similar places.

3.2.10 Rate Places

Normal Flow

1. User enters search message with text or voice.
2. System pass the message to Watson API.
3. System receives reply from Watson API.
4. System verify the type of searched places and search for most suitable places based on tags and distances.
5. System obtain the search results and displays the recommended places to user.
6. User click on “Rate this” button.
7. System displays a list of rating scores to user.
8. User selects desired score and click on it.
9. System stores the rating score.

Alternate Flow

3a System fail to receive response from Watson API and terminate session.

4a System detects new tag and call the Word Associations API to compare the new tag and existing tag.

4b System replaces the new tag to existing tag if the new tag is associated with the existing tag.

5a System failed to find a result, displays “No results” message and terminate session.

8a System terminate the rating session if user didn’t click on any rating score and press outside the rating scores list.

3.2.11 View User Details

Normal Flow

1. Admin click on the app logo 5 times.
2. Admin enters admin key.
3. Admin click on the “OK” button.
4. System displays admin main page.

5. Admin select a user and click on the detail button on the right side of the user.
6. System displays the detail of the user selected.

Alternate Flow

4a System displays error message and terminate session if the admin key entered is wrong.

3.2.12 Change Design Parameter

Normal Flow

1. Admin click on the app logo 5 times.
2. Admin enters admin key.
3. Admin click on the “OK” button.
4. System displays admin main page.
5. Admin click on the “SET VALUE” button.
6. Admin enter new values.
7. Admin click on confirm button.
8. System update the design parameter.

Alternate Flow

4a System displays error message and terminate session if the admin key entered is wrong.

8a System displays error message and terminate session if values are invalid.

3.2.13 View Search Data

Normal Flow

1. Admin click on the app logo 5 times.
2. Admin enters admin key.
3. Admin click on the “OK” button.
4. System displays admin main page.

5. Admin click on “OVERALL” or “BY DATE” button.
6. System displays a bar chart graph.

Alternate Flow

4a System displays error message and terminate session if the admin key entered is wrong.

6a System terminate session if there is no data.

3.2.14 Self-Learning

1. User enters search message with text or voice.
2. System pass the message to Watson API.
3. System receives reply from Watson API.
4. System verify the type of searched places and search for most suitable places based on tags and distances.
5. System obtain the search results and displays the recommended places to user.
6. User gives feedback.
7. System increase/deduct the score of tag that associated to the recommended place.

Alternate Flow

3a System fail to receive response from Watson API and terminate session.

4a System detects new tag and call the Word Associations API to compare the new tag and existing tag.

4b System replaces the new tag to existing tag if the new tag is associated with the existing tag.

5a System failed to find a result, displays “No results” message and terminate session.

6a System terminate session if user close the pop out window directly.

6b User use up all feedback chance and terminated session, the chance is 3 times per hours.

7a System remove the tag of place if the rating score deducted to 0.

3.3 System Flowchart

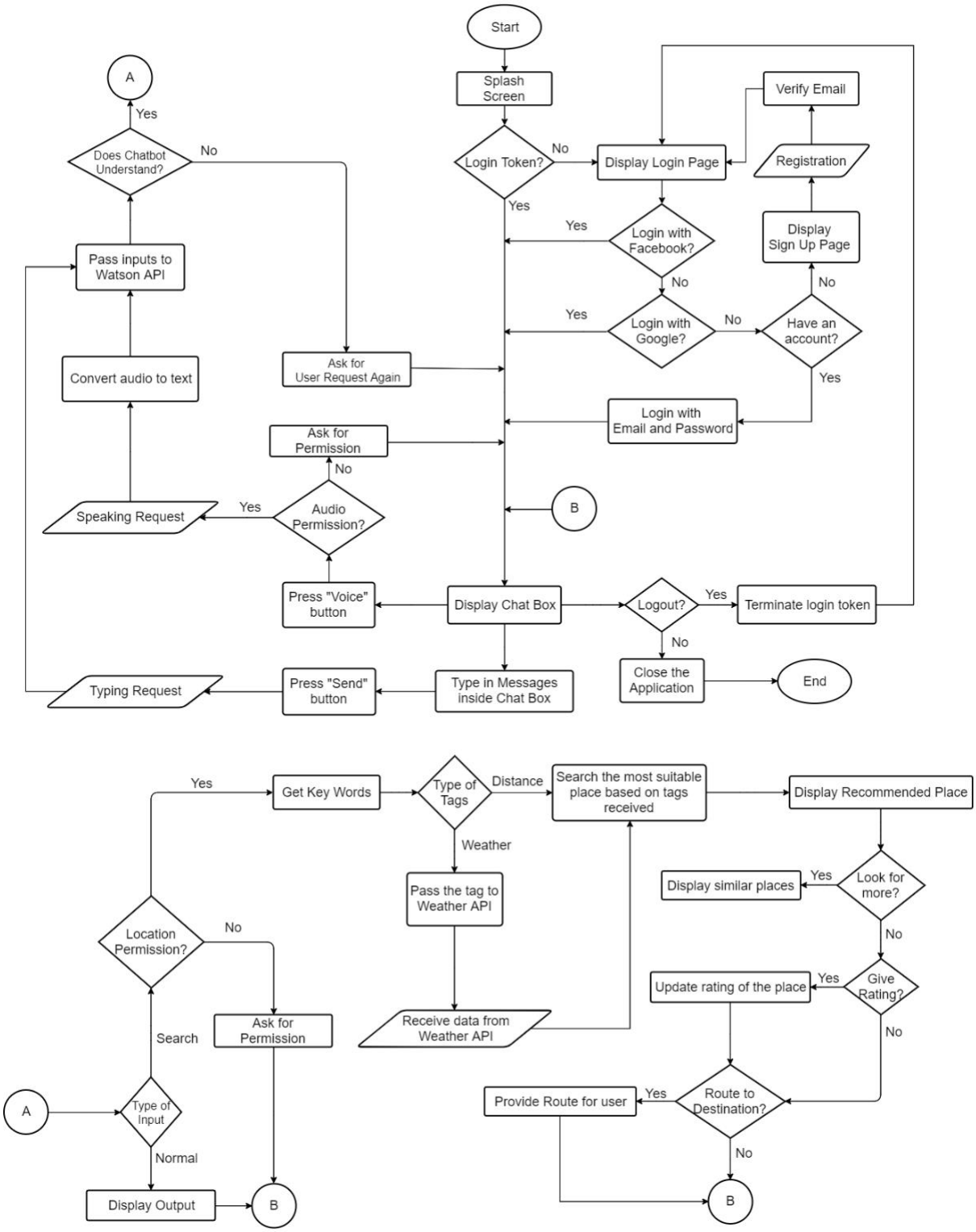

Figure 3.2 System Flow Diagram

3.4 Activity Diagrams

3.4.1 Sign Up

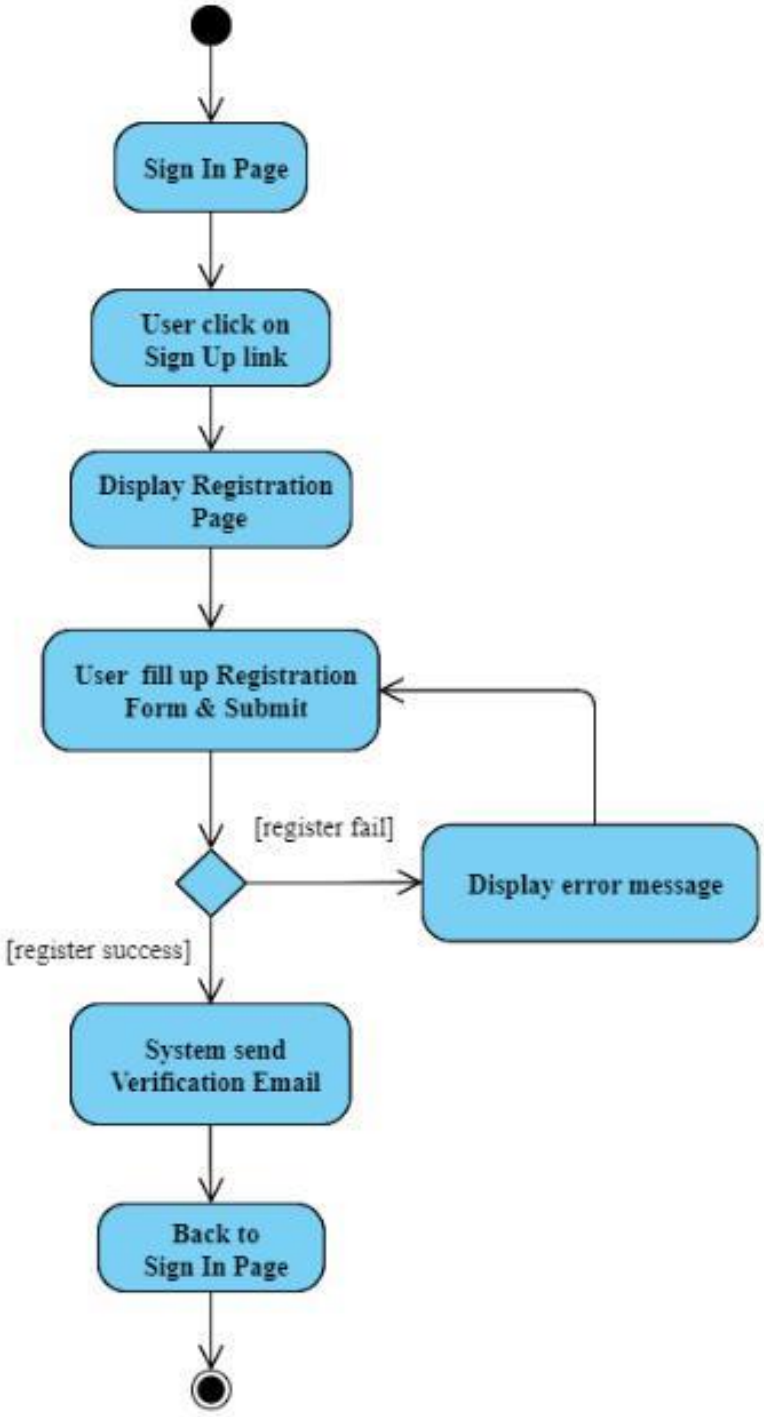

Figure 3.3 Activity Diagram of Sign Up

3.4.2 Sign In

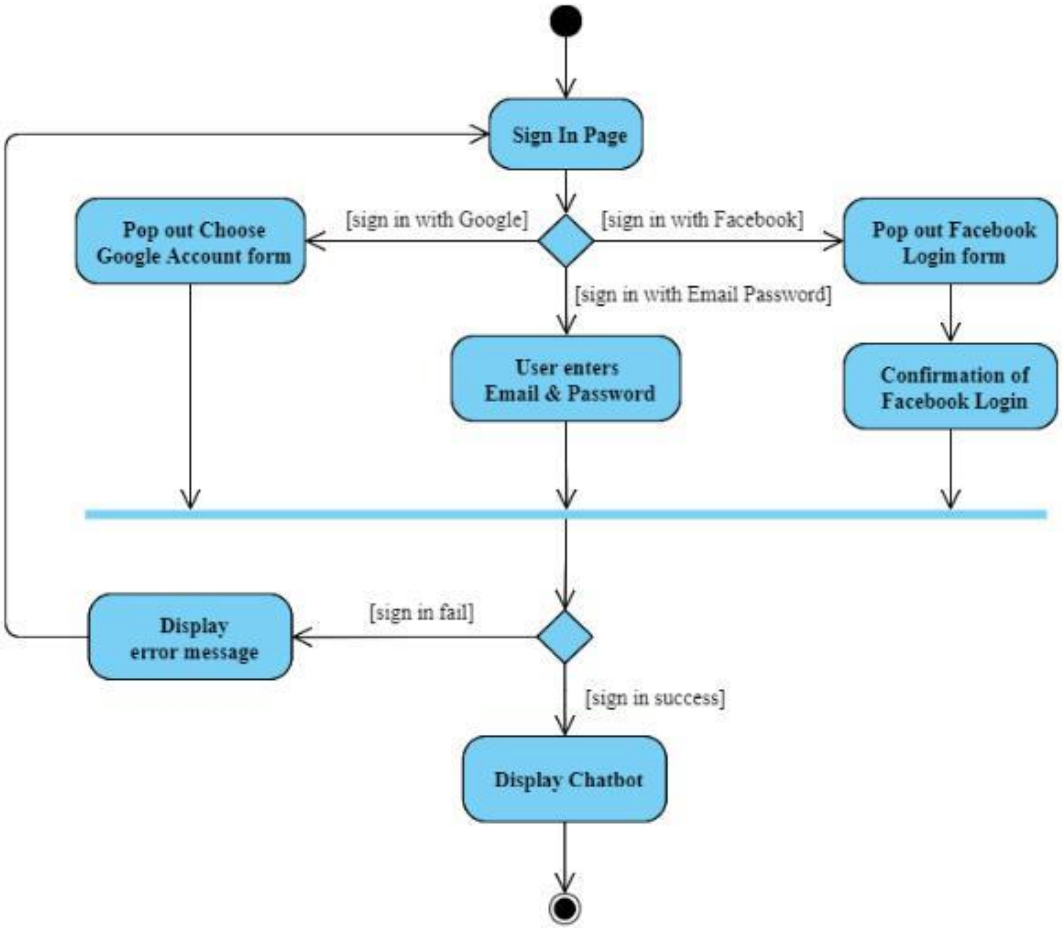

Figure 3.4 Activity Diagram of Sign In

3.4.3 Communicate with Chatbot

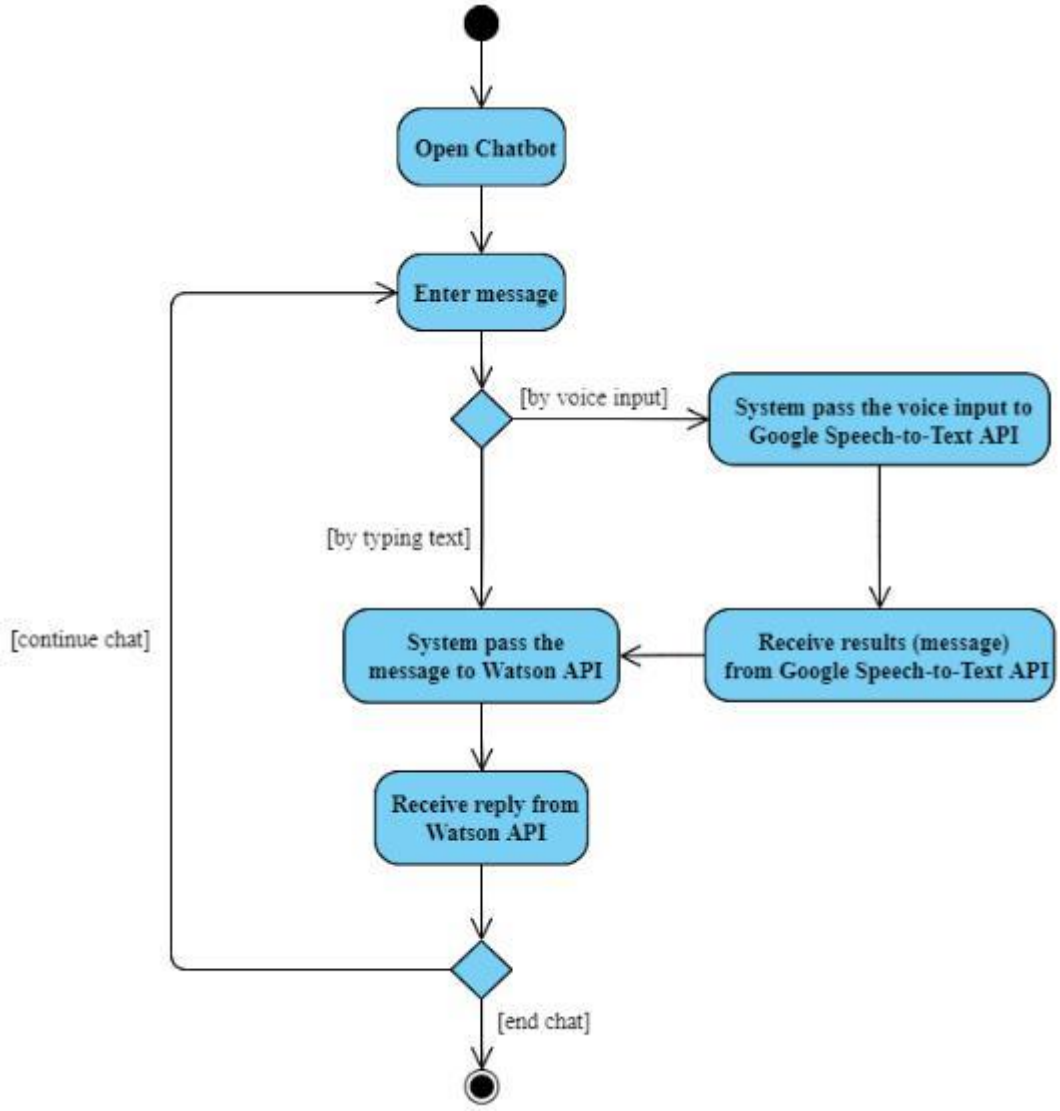

Figure 3.5 Activity Diagram of Communicate with Chatbot

3.4.4 Search Places

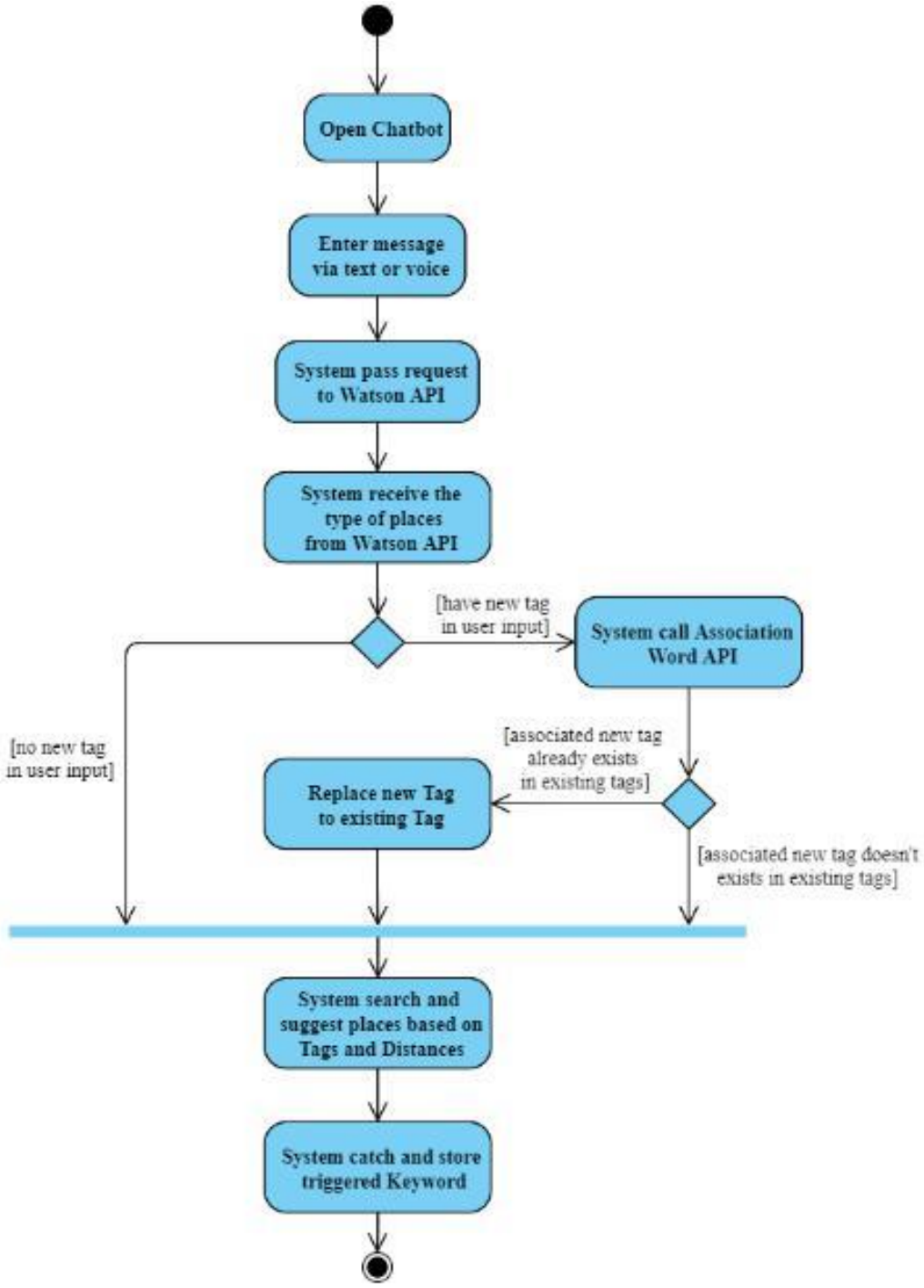

Figure 3.6 Activity Diagram of Search Places

3.4.5 Route to Destination

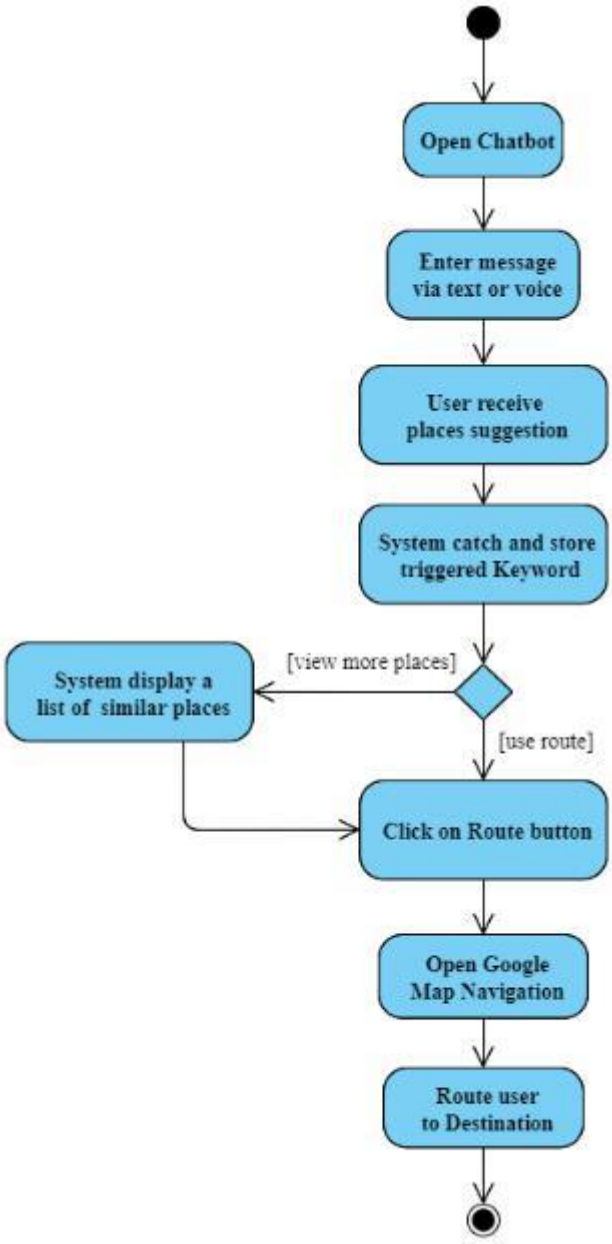

Figure 3.7 Activity Diagram of Route to Destination

3.4.6 View More Places

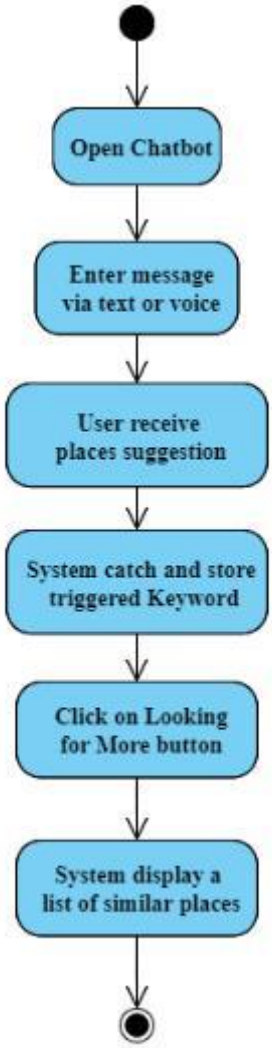

Figure 3.8 Activity Diagram of View More Places

3.4.7 Rate Places

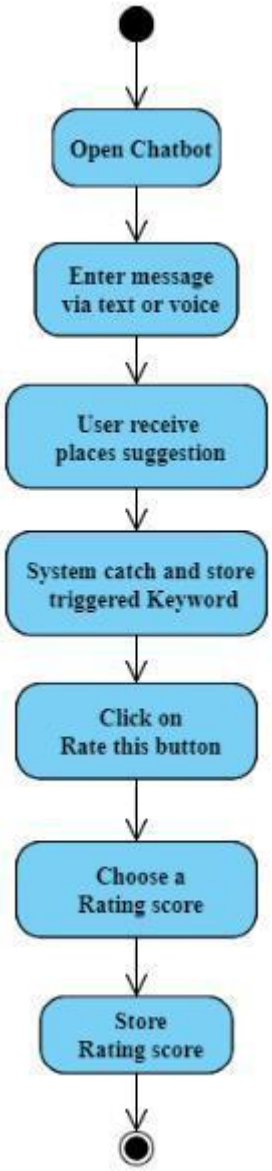

Figure 3.9 Activity Diagram of Rate Places

3.4.8 View User Details

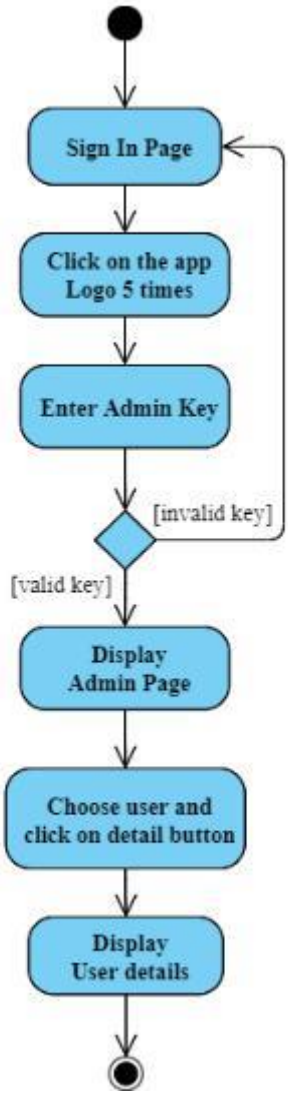

Figure 3.10 Activity Diagram of View User Details

3.4.9 Change Design Parameter

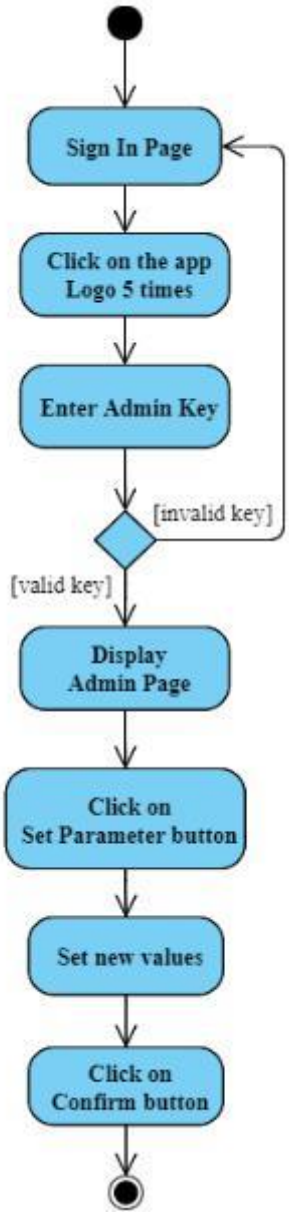

Figure 3.11 Activity Diagram of Change Design Parameter

3.4.10 View Search Data

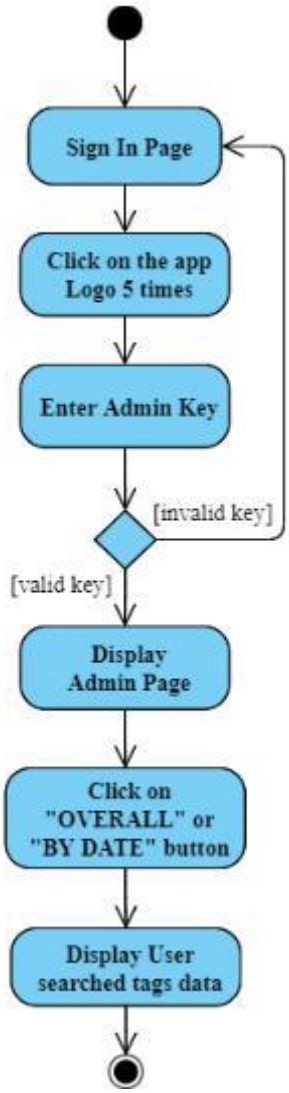

Figure 3.12 Activity Diagram of View Search Data

3.4.11 Self-Learning

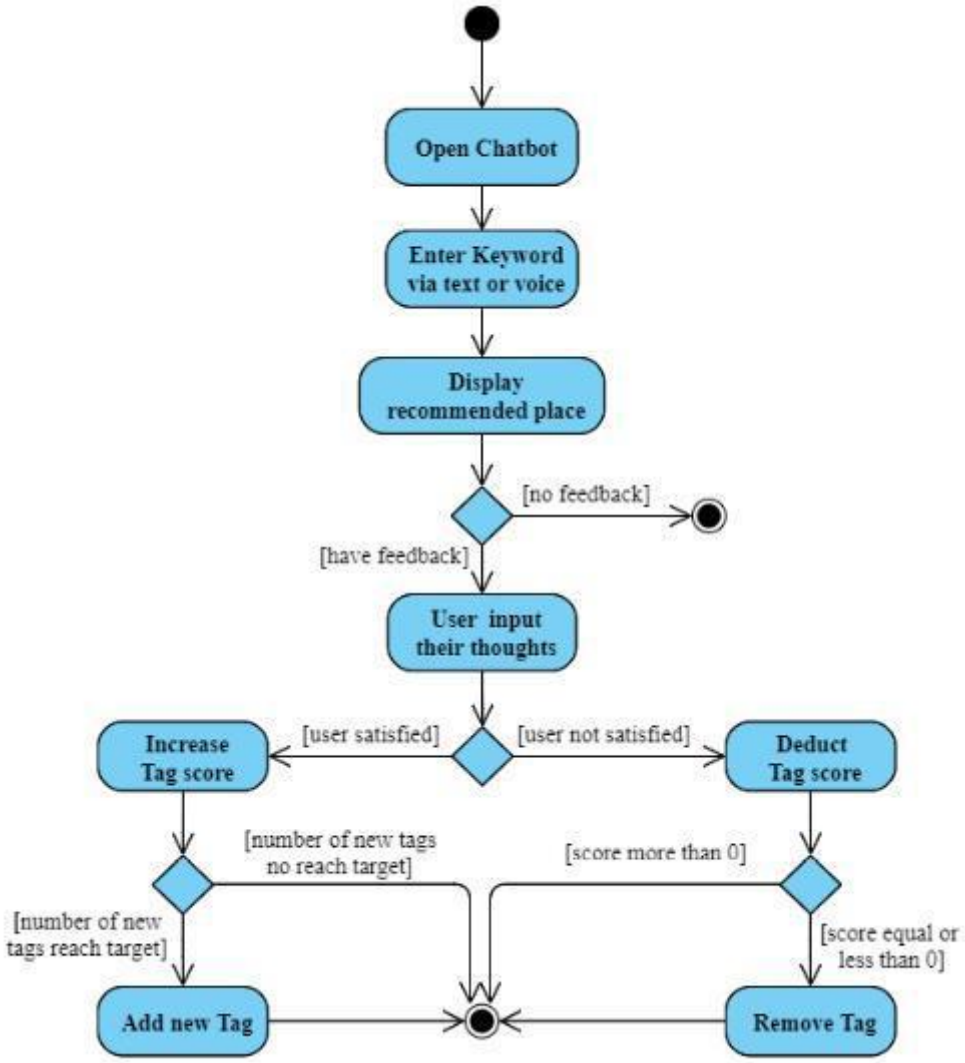

Figure 3.13 Activity Diagram of Self-Learning

3.5 Class Diagrams

Figure 3.14 Class Diagram 1

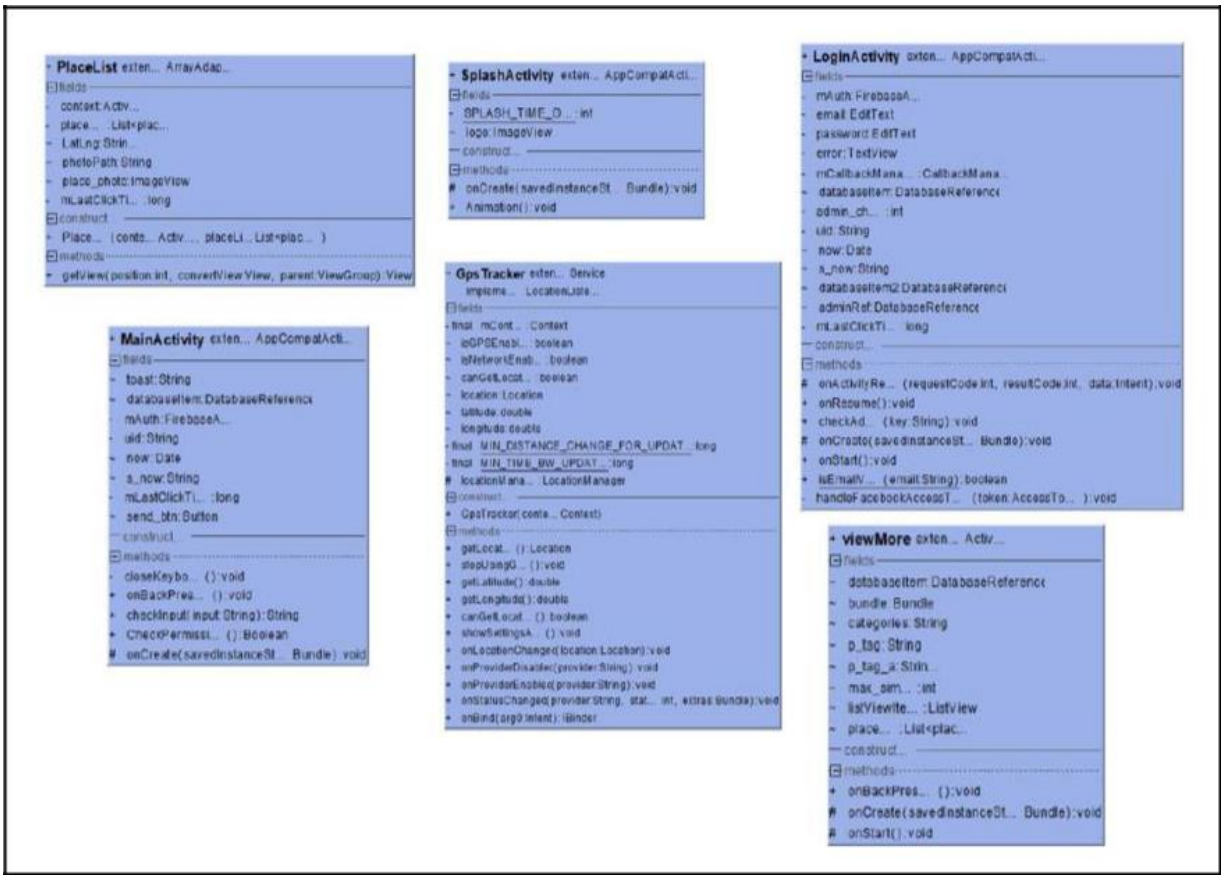

Figure 3.15 Class Diagram 2

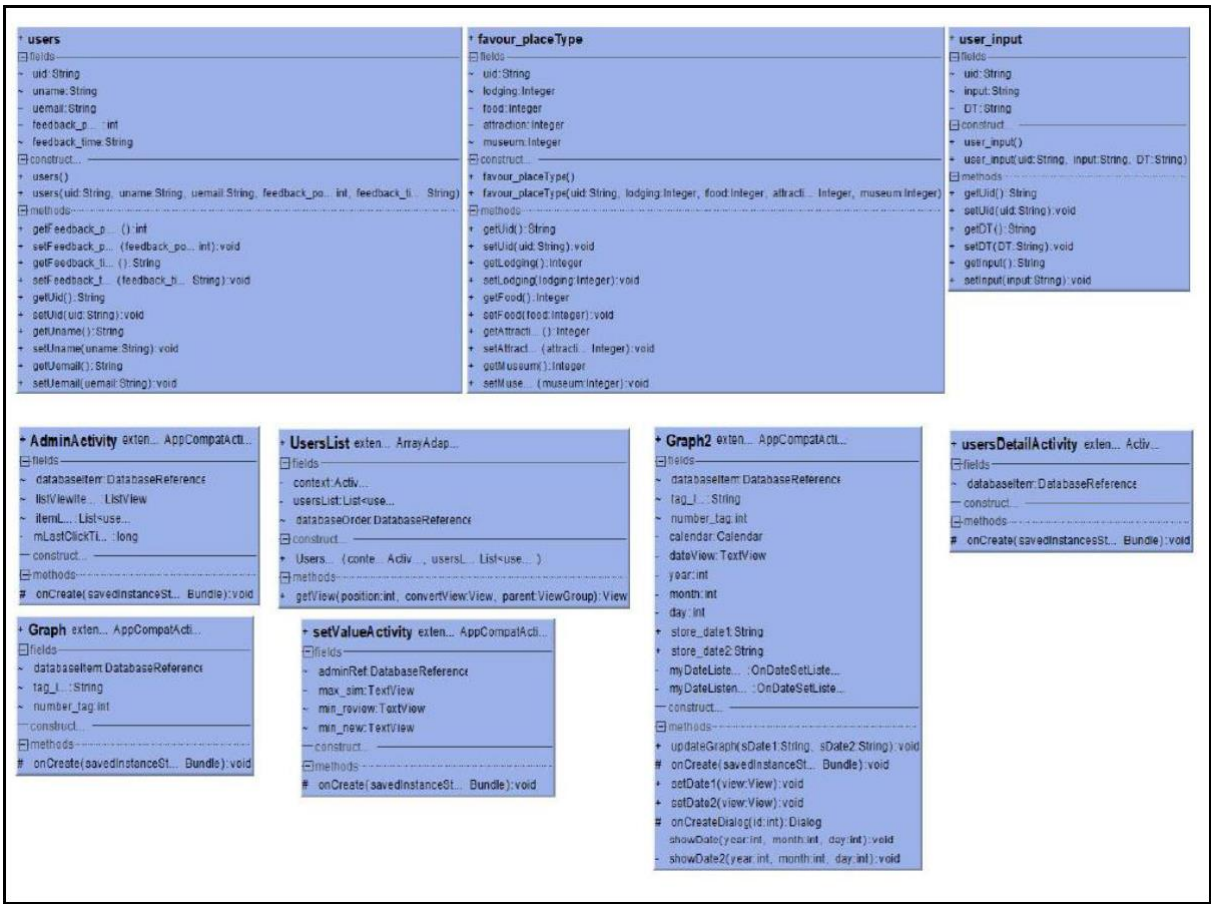

Figure 3.16 Class Diagram 3

Figure 3.17 Class Diagram 4

Chapter 4: Methodology & Tools

4.1 Methodology

The methodology used in this project is Kanban methodology. Kanban is one of the agile methodologies that can deliver features faster as its cycle time is short and flexible on changing environment. The reason is because this project does not involve in big organization. A simple and easy to use of methodology like Kanban is required.

This methodology consists of three lists, which is ToDo, Doing, and Done. First of all, list out all tasks including hardware installation, development of application's features and report writing, into ToDo list. Take some tasks from ToDo to Doing. Those tasks must be ensuring can be completed on a day, based on own ability. At the end of the day, take completed tasks from Doing to Done. Incomplete task will be staying in Doing list and repeat from the beginning step. Keep repeating these steps until all the tasks completed.

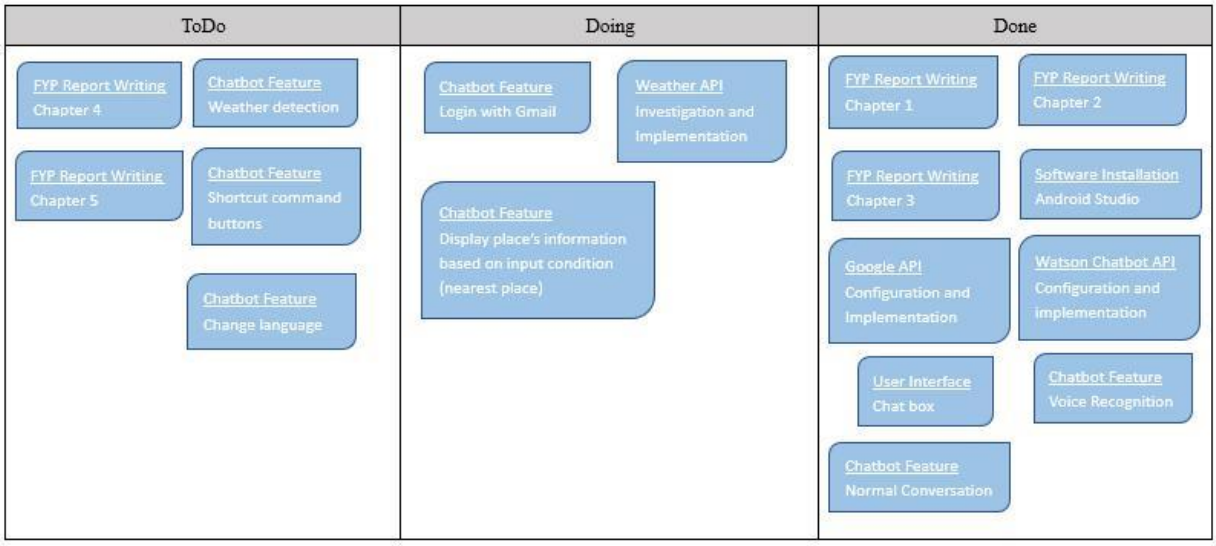

Figure 4.1 Kanban

4.2 Tools and Technology Used

Tools & Technology	Type	Description
Android Studio	Software	A platform used to develop android application with various programming Language (For example, Java).
Laptop	Hardware	A device used to run Android Studio.
Phone	Hardware	A device used to run android application.
Google Speech-to-Text	API	An API that can convert audio to text.
Firebase	Database	A cloud database used to store data and information.
Java8	Programming Language	A high-level programming language used to develop application in Android Studio.
XML	Markup Language	A markup language used to develop layout interface of an application in Android Studio.

Table 4.1 Tools and Technology Used

4.2.1 Laptop

Brand: Dell

Series: Vostro 5470

Processor: Intel® Core™ i5-4210U CPU @ 1.70GHz 2.40GHz

RAM: 8GB

SSD: 300GB

GPU: NVDIA GeForce GT 740M

OS: 64-bit Operating System, x64-based processor

Window: Windows 10 Pro

4.2.2 Phone

Brand: Vivo

Series: V9

Android Version: 9

CPU: 2.2GHz Snapdragon 626 Octa-core

RAM: 4GB

Internal Storage: 64GB

4.2.3 Android Studio

Version: Android Studio 3.6

Build number: AI-192.7142.36.36.6200805

JRE: OpenJDK 64-Bit Server VM (build 25.212-b04, mixed mode)

4.3 Project Timeline

Final Year Project I (Semester JAN 2020)														
Tasks	Weeks													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Define Project Scope														
Define Problem Statement														
Define Project Objective														
Determine Requirements														
Determine Tools and Technology														
Design Use Case														
Design System Flowchart														
Design User Interface														
Create User Interface														
Coding														
Create Firebase														
Integrate Google API														
Integrate Watson API														
Feature Testing														
Final Year Project II (Semester MAY 2020)														
Tasks	Weeks													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Modify User Interface														
Modify Code														
Modify Firebase														
Integrate Weather API														
Feature Testing														
Integration Testing														
System Testing														
Product Evaluation														

Figure 4.2 Project Timeline

Chapter 5: System Requirement

5.1 Functional Requirements

5.1.1 Admin Perspectives

- Admin must have the ability to open Admin Page.
- Admin must have the ability to enter Admin Key.
- Admin must have the ability to view User details.
- Admin must have the ability to view Users Search data.
- Admin must have the ability to set or change design parameter.

5.1.2 User Perspectives

- User must have the ability to register a new account.
- User must have the ability to sign in with their Email account.
- User must have the ability to sign in with Facebook account.
- User must have the ability to sign in with Google account.
- User must have the ability to communicate with Chatbot.
- User must have the ability to search places by typing message or speak out loud.
- User must have the ability to view more similar places.
- User must have the ability to rate places.
- User must have the ability to use Google route function.
- User must have the ability to give feedback to Chatbot.
- User must have the ability to sign out.

5.1.3 System Perspectives

- System must have the ability to connect with Facebook Login service.
- System must have the ability to connect with Google Login service.
- System must have the ability to connect with Firebase Authentication service.
- System must have the ability to connect with Firebase Database service.
- System must have the ability to retrieve user's current location.
- System must have the ability to store and retrieve data from Firebase Cloud Database.
- System must have the ability to give responses to user after processing.
- System must have the ability to display error messages.
- System must have the ability to retrieve data from APIs.
- System must have the ability to ask permissions from user.
- System must have the ability to provide most suitable places to user.

5.2 Non-Functional Requirements

5.2.1 Usability

- System must have the ability to install the app into all android phone devices.
- System must have the ability to display an appropriate and comfortable user interface design towards all different type of android phone devices.
- User must have the ability to enjoy the services provided by system without going through any tutorials.

5.2.2 Reliability

- User must have the ability to provide real feedback to system.
- System must have the ability to provide appropriate error messages in a clear and simple format.

5.2.3 Performance

- System must have the ability to give response to user within 5 seconds.
- System must have the ability to prevent app crash.
- System must have the ability to provide all of the services the app has.

5.2.4 Accuracy and Precision

- System must have the ability to retrieve correct data from Firebase Cloud Database.
- System must have the ability to get accurate user's current location data.

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Faculty of Information and Communication Technology (Kampar Campus), UTAR.

Chapter 6: System Specification

6.1 Splash Screen & Sign In Page

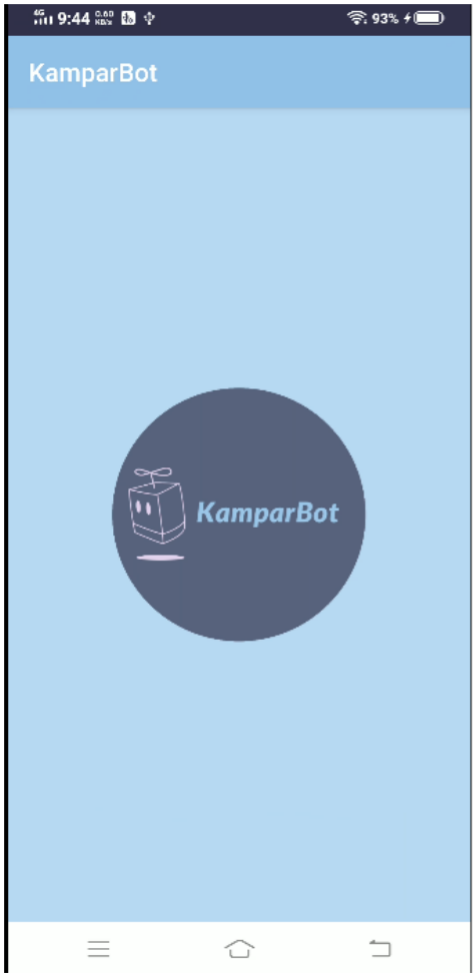


Figure 6.1 Splash Screen

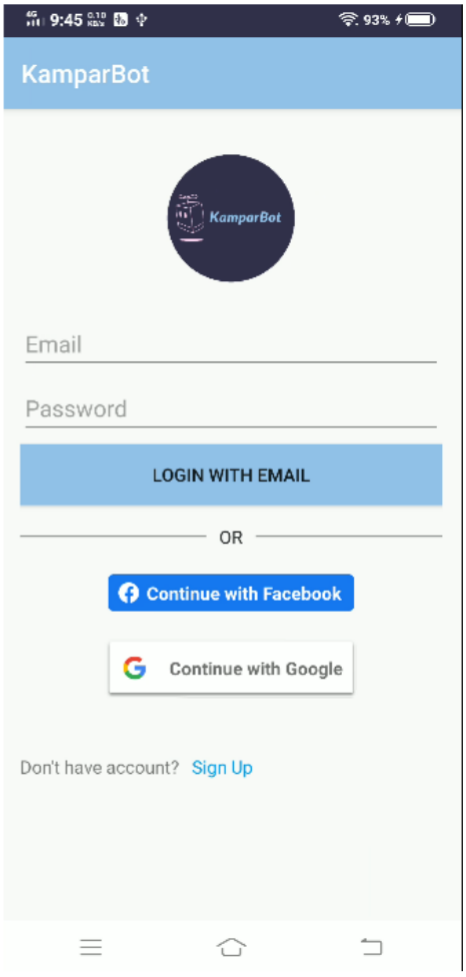


Figure 6.2 Sign In Page

Every time user opens the application, a splash screen will show up. Splash screen will not show up if user didn't close and resume the application. After showing up the splash screen, if user have signed in already, it will directly go to Chatbot Main page, otherwise it will display Sign In page. Here user have 3 options to choose to sign in: one is by Email and password, one is by Facebook login, and one is by Google login. If user wish to sign in with Email and password, user must enter their Email address and password correctly then press on "LOGIN WITH EMAIL" button to sign in. If sign in process success, the application will direct user to Chatbot Main page, otherwise it will display an error message telling the user sign in failed. User can click on the "Sign Up" link to enter Sign Up page to create a new account.

6.2 Sign Up Page

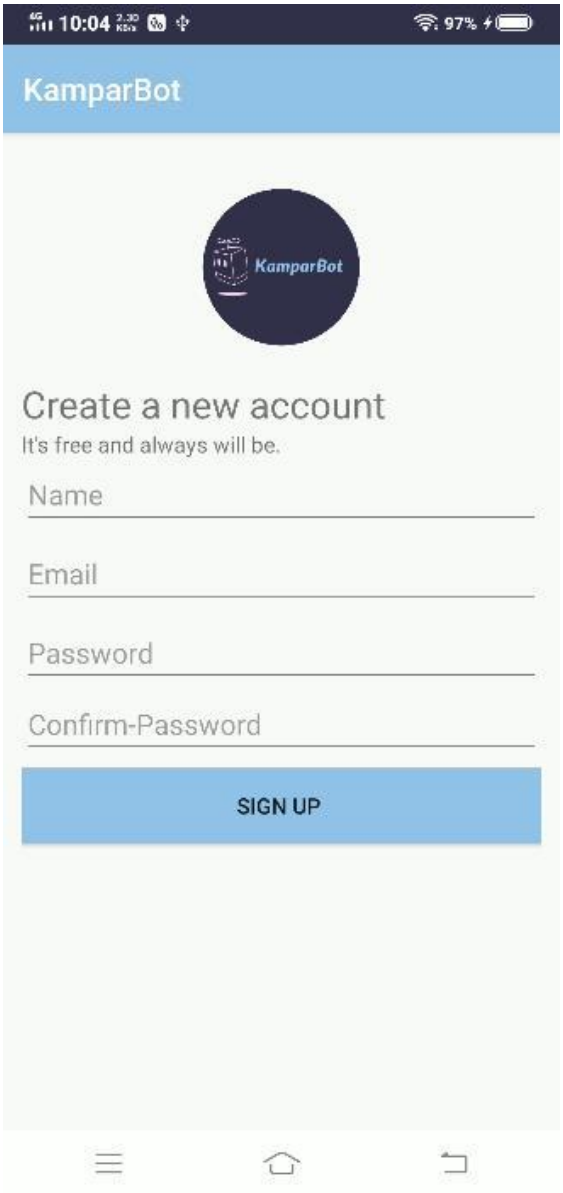


Figure 6.3 Sign Up Page

User who do not have an account need to create a new account in this Sign Up page. User need to provide their name, email address and password in order to create a new account. If the sign up process success, the application will then send a verification email to user's Email address to verify their account, otherwise it will display an error message telling the user sign up failed. User need to go to their Email account and click on the link in the verification email to verify their account before sign in to this application.

6.3 Facebook Login

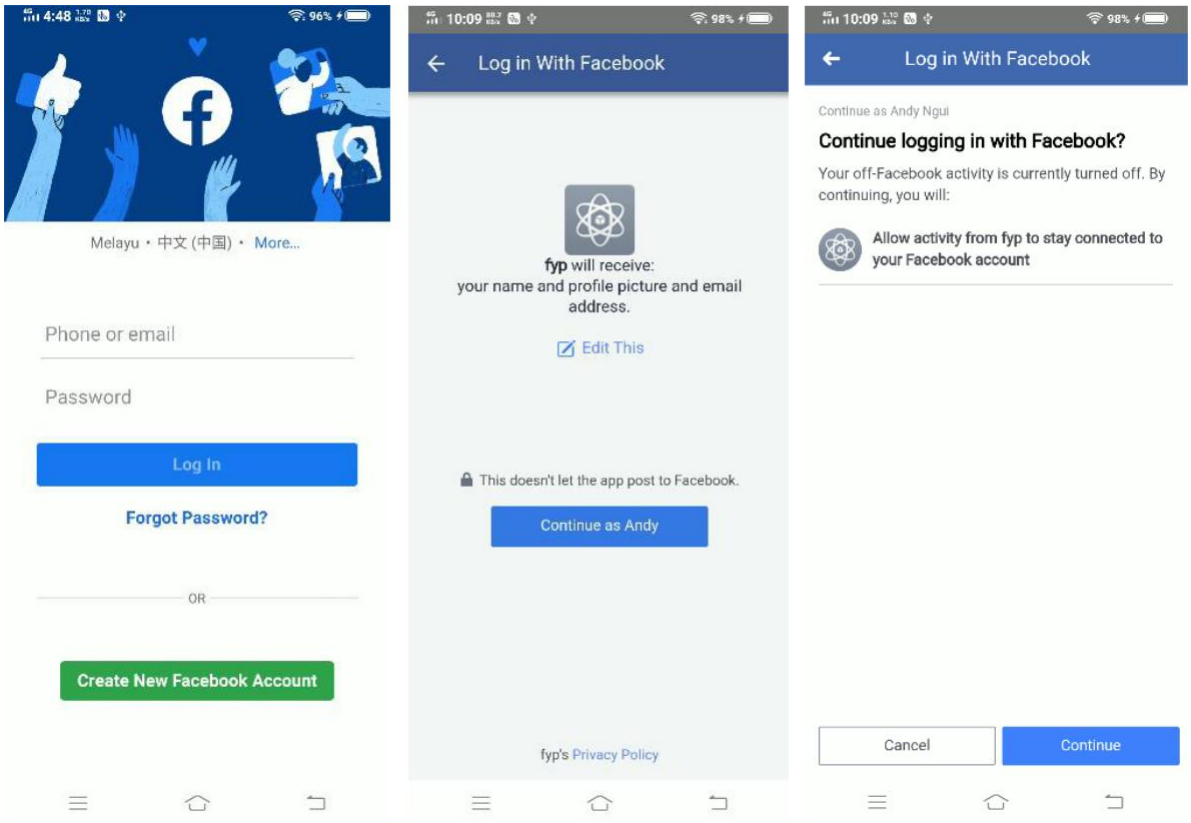


Figure 6.4 Facebook Login Pages

If user choose to sign in with Facebook account, user need to click on the “Continue with Facebook” button. After that, if user haven’t login their Facebook account on their device, the application will direct user to Facebook login page to login first, otherwise it will directly ask user to give permission to the Facebook application to login. After granting permissions, the application will direct user to Chatbot Main page.

6.4 Google Login

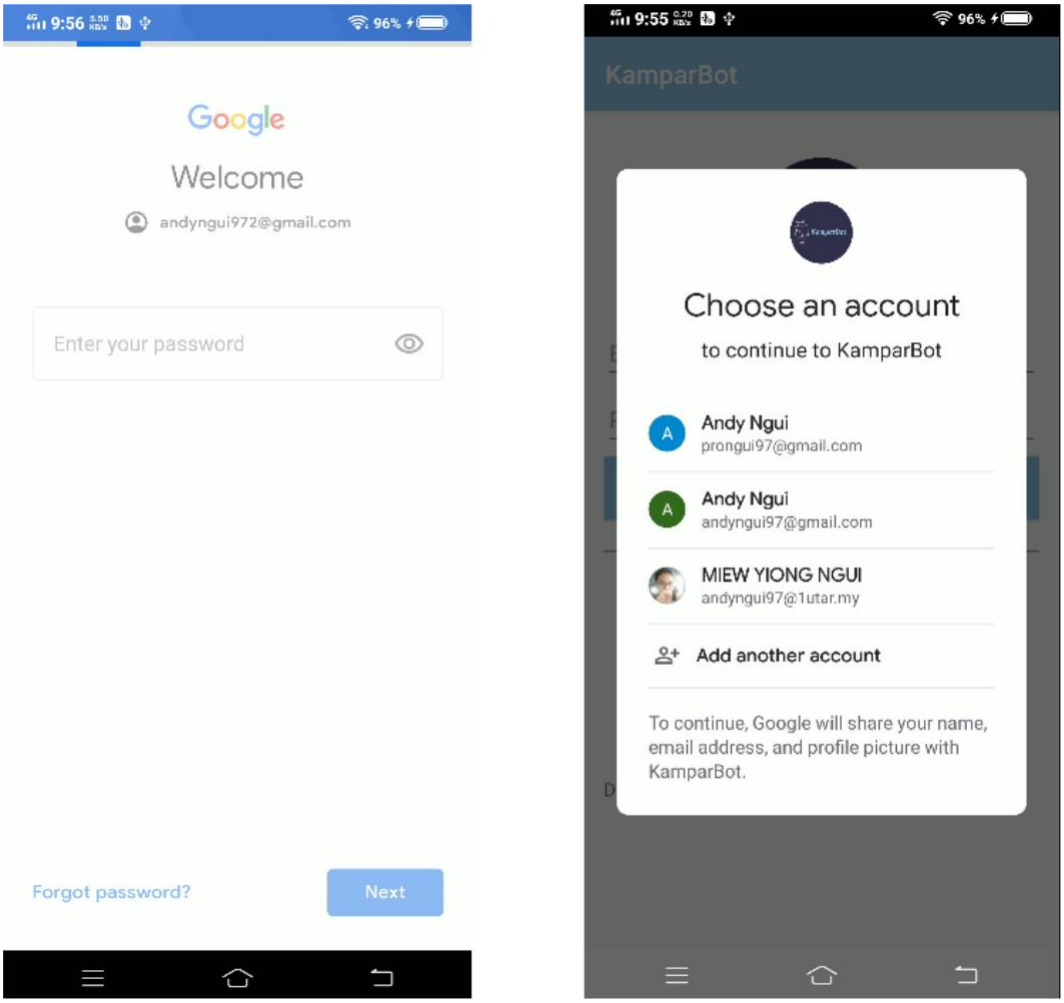


Figure 6.5 Google Login Pages

If user choose to login with Google account, user need to click on the “Continue with Google” button. After that, if user didn’t have a Google account logged in on their device, the application will direct user to Google account login page to login first, otherwise it will pop out a dialog window and ask user to choose an account to continue login. User can choose to add another Google account to login to this application. After choosing an account to login, the application will direct user to Chatbot Main page.

6.5 Main Page & Simple Conversation with Sound (Text to Speech)

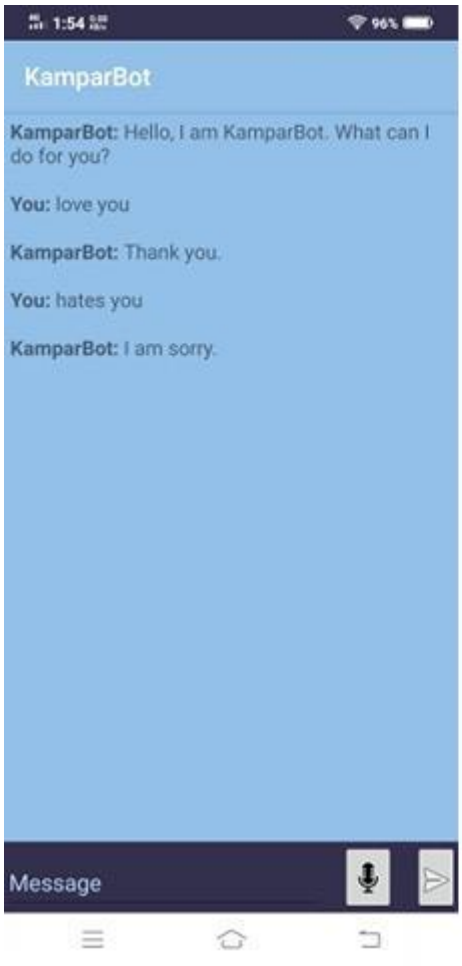


Figure 6.6 Normal Conversation Screen 1

Figure 6.7 Normal Conversation Screen 2

Here is the Chatbot Main page with an AI service, KamparBot. User can have some normal and simple conversation with KamparBot. When KamparBot replies, user's mobile phone will have sounds come out too.

6.6 Voice Recognition & Recommended Place

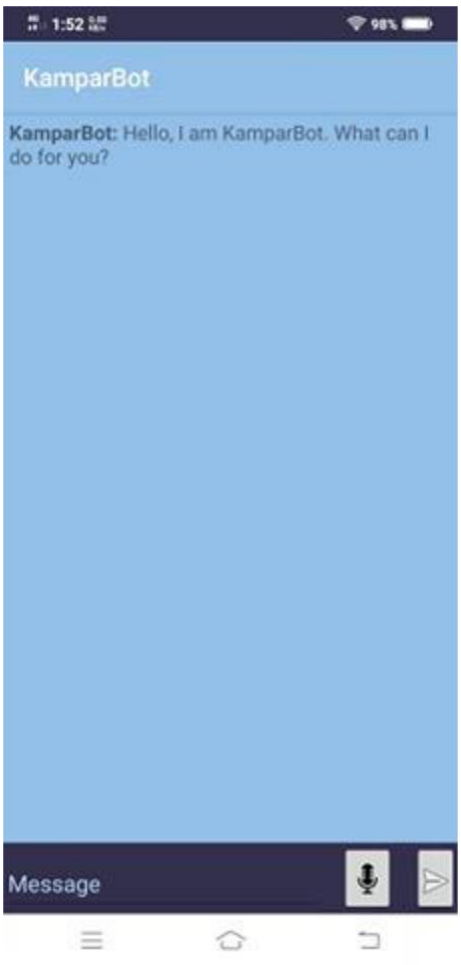


Figure 6.8 Main Chat Box Screen

Figure 6.9 Voice Recognition Screen 1

When open KamparBot application, user will see the main chat box. Users can send their requests through voice or text. In this case, user can try to use Voice feature by clicking the voice icon button. After clicking the button, it will ask the user for audio permission in order to use this feature. After user allowed it, it will pop out a window to let user say something.

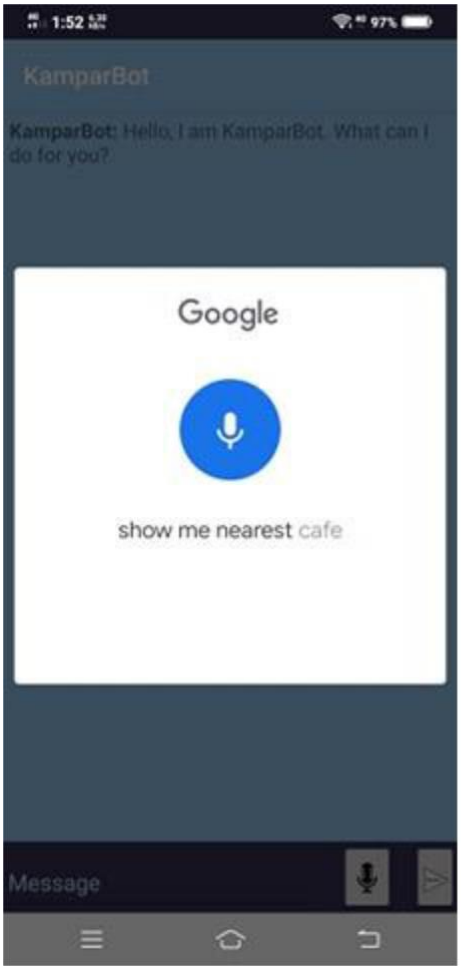


Figure 6.10 Voice Recognition Screen 2 *Figure 6.11 Recommended place Screen 1*

In this example, the user requests KamparBot to show nearest café. After that, KamparBot will convert the voice into text and try to understand the request, which is find the nearest café. If success, KamparBot will then pop out the recommended café through a pop out window for user to choose. User can choose to route to the destination or not. User can also choose to view more places or rate the place on this pop out window.

6.7 Rating Place & View More Similar Places

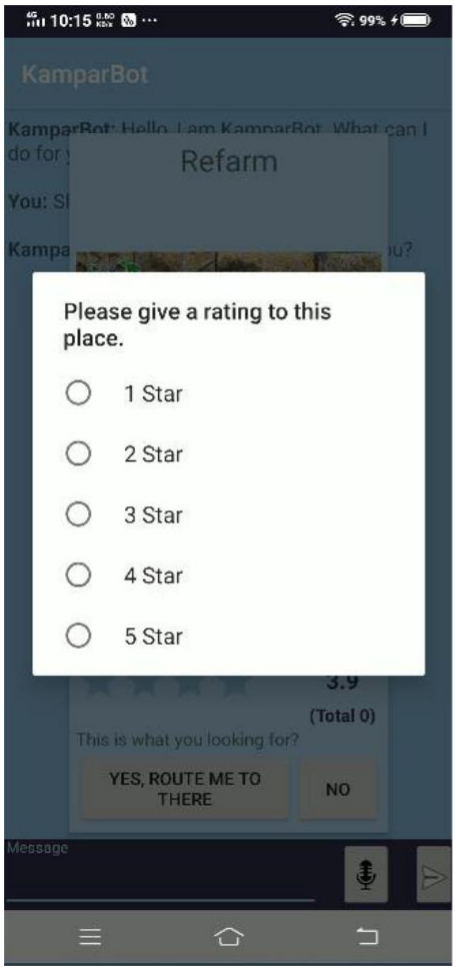


Figure 6.12 Rating Place Screen

Figure 6.13 View More Similar Places Page

After KamparBot showing the recommended place, user can choose to rate the place. User need to click on the star image below Rate this to rate the place. After clicking on the star image, KamparBot will then pop out a dialog window with rating scores for user to rate the place. User can select a desired rating score and click on the selected rating score to rate the place. If user doesn't want to rate, just click outside the dialog window to exit the rating scores dialog. After user clicking on the selected rating score, KamparBot will then update the rating score of the place to the database. User also can choose to view more similar places by clicking on the "LOOKING FOR MORE" button. After clicking on the button, KamparBot will display a list of similar places to user.

6.8 Route to Destination

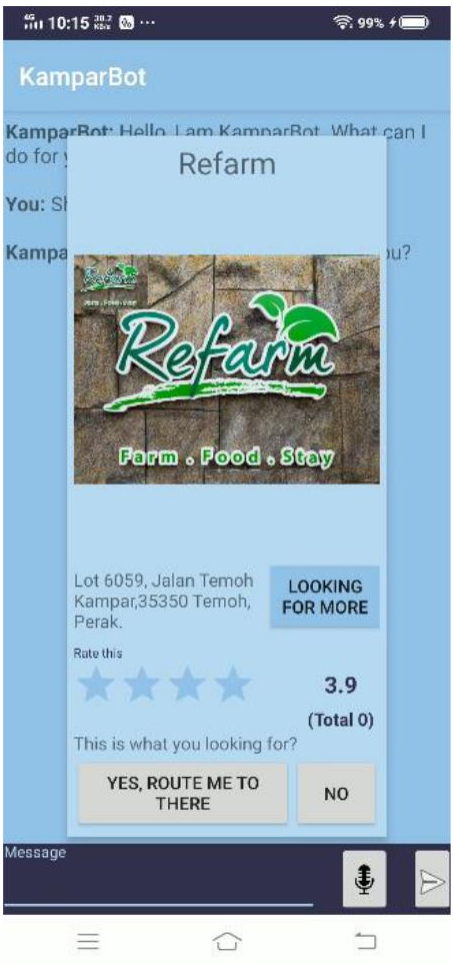


Figure 6.14 Recommended place Screen 2

Figure 6.15 Google Map Page

User can choose to route to the destination by clicking on the route button. After clicking on the route button, KamparBot will direct the user to Google Map and then route user to the destination. Google Map will show how much the time needed for user to reach the destination.

6.9 Admin Main Page & View User Details

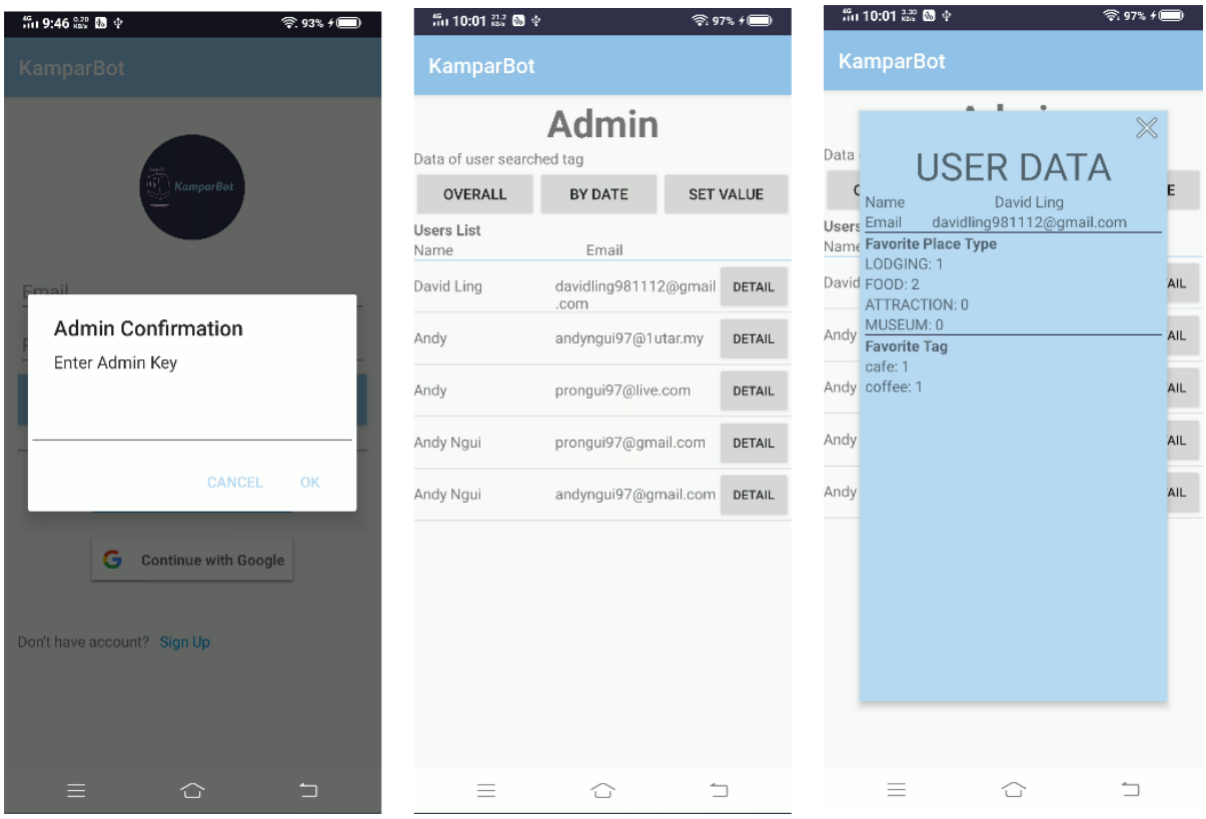


Figure 6.16 Admin Main Page & View User Details

Admin page is for admin and developer of this application only. User cannot access to this Admin page. For Admin, Admin need to click on the Logo in the Sign In page 5 times in order to enter Admin Main page. A dialog window will then pop out and ask Admin to enter admin key. Admin must key in admin key correctly, otherwise the application will terminate Admin login session. After login successfully, the application will direct Admin to Admin Main page. In Admin Main page, Admin can view each user's detail by clicking on the detail button on the right side of each user's account. After clicking on the detail button of an account, the application will then pop out a window that show the user's details clearly.

6.10 Change Design Parameter

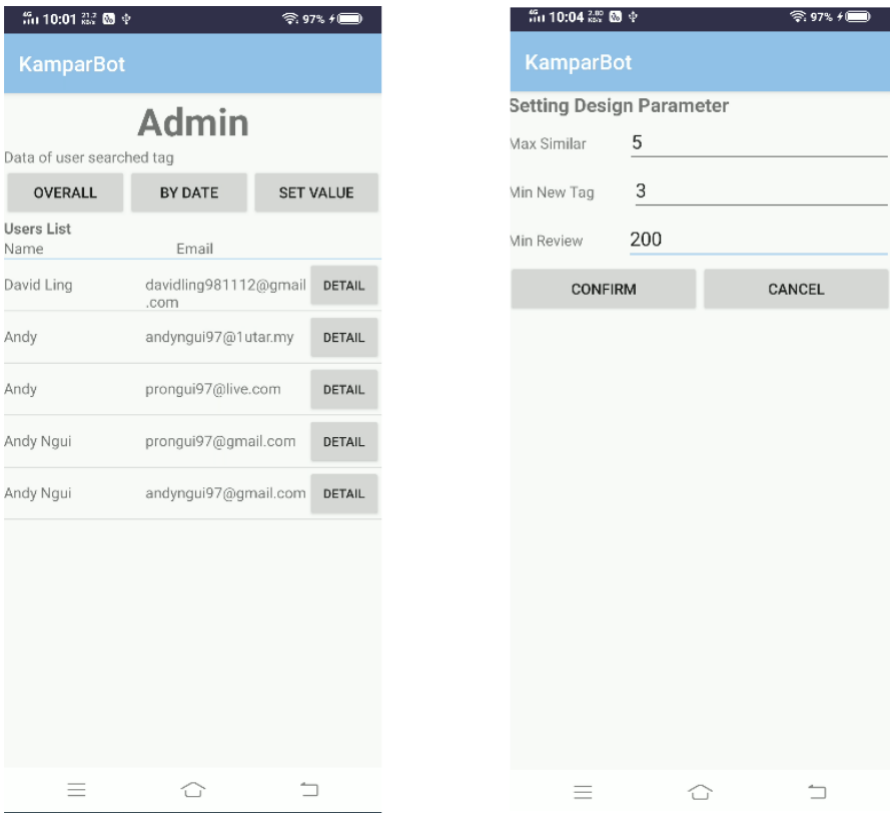


Figure 6.17 Change Design Parameter Page

Admin can set the design parameter of the application by clicking on the “SET VALUE” button in Admin Main page. After clicking the button, the application will then direct Admin to Change Design Parameter page. Admin can change the values and click on confirm button to change the design parameter of the application. If Admin don’t want to change, just click on cancel button to go back to Admin Main page.

6.11 View Users Search Data

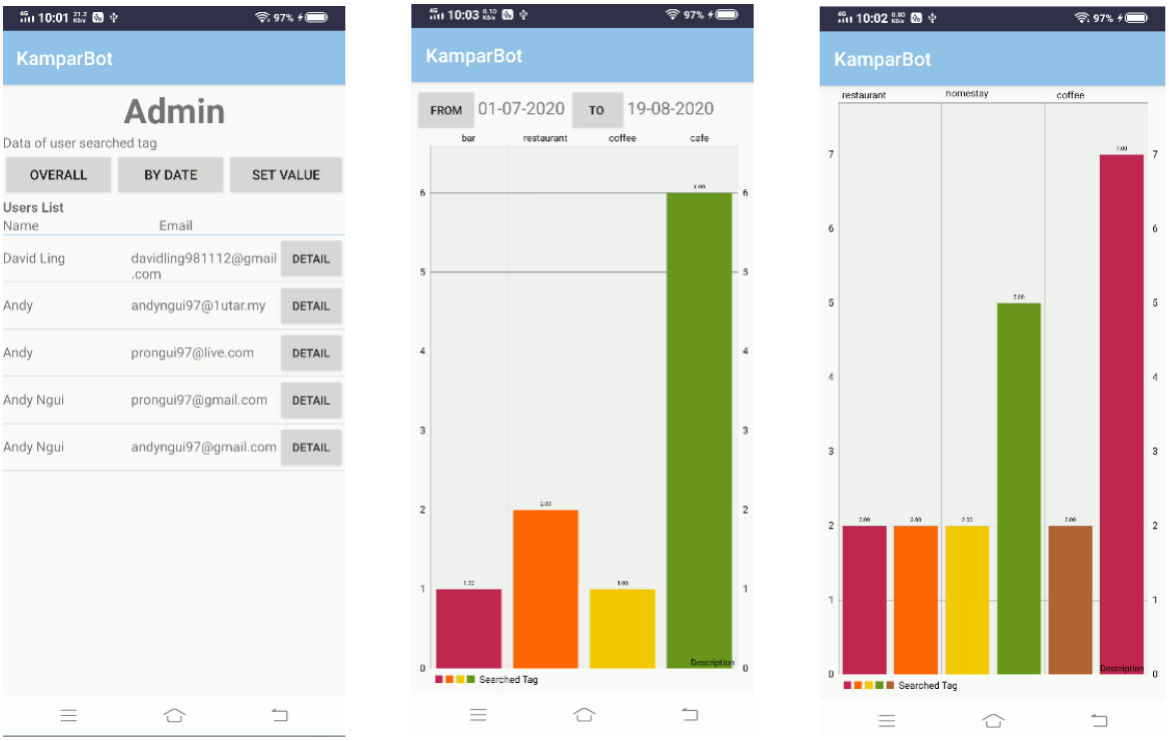


Figure 6.18 View User Search Data Pages

Admin can choose to view users search data by clicking on “OVERALL” or “BY DATE” button in Admin Main page. If click on the “OVERALL” button, the application will then display a bar chart graph showing the tags searched by users. If click on the “BY DATE” button, the application will also display a bar chart graph showing the tags searched by users. The only difference is that Admin can select a date range to observe the data of tags searched by users in specific date.

Chapter 7: Implementation and Testing

7.1 System Implementation

The Second generation of KamparBot is done and build into APK file using Android Studio. The APK file is then uploaded to Google Drive for all team members of GoKampar and UTAR Kampar students to download and test. This APK file can easily installed into android mobile phone and also mobile emulator in Android Studio.

7.1.1 Application Implementation

Practices	Vivo V9	Nexus 5X (Emulator)
a) Install successful without error	Pass	Pass
b) Can run the application properly without crash	Pass	Pass
c) Can detect accurate device current location.	Pass	Pass
d) Can successfully connect to all API services without any error	Pass	Pass
e) Can successfully receive responses from APIs	Pass	Pass
f) UI arranged and display neatly without malformed view	Pass	Pass
g) Performance of application meet the target	Pass	Pass
h) Can perform all functions without error	Pass	Pass

Table 7.1 Implementation table

7.1.2 User Feedback

No.	Problem	Reason	Solution	Result
1	Some user cannot install the app APK successfully in their mobile phone.	User did not allow installation from unknown source.	Inform them to allow installation from unknown source for their mobile phone.	Application still in developing stage, not final version. Therefore, upload to Google Play Store after complete the developing of the application will be the future work of this project.
2	Type of places still not enough.	Current developing stage only have 4 type of places can be search.	Add more type of places.	Still maintain only 4 type of places available, adding new type of places will be the future work.
3	User cannot use Facebook account login.	Facebook only allow FB Developer account to login.	Change Facebook login code or Upload to Google Play Store and pass verification to Facebook.	Changing code is very difficult for current stage, thus only can upload to Google Play Store to verify. The verification is still in pending state.

Table 7.2 User Feedback table

7.2 Test Plan and Results

Test Scenario	Test Case	Description	Inputs	Expected Result	Actual Result
TS01: Sign Up/Register	TC01-1: Sign up/Register a new account.	User fill in their name, Email and password to create a new account.	Enter valid Email and both password and confirm password are matched.	Account created successfully, a verification Email sent and inform user to verify their account through the Email sent.	User received verification Email. Meet expectation.
			Enter invalid Email and both password and confirm password matched.	Sign up failed and display error message to user.	User received error message. Meet expectation.
			Enter registered Email and both password and confirm password matched	Sign up failed and display error message to user.	User received error message. Meet expectation.
			Enter valid Email and both password and confirm password not matched.	Sign up failed and display error message to user.	User received error message. Meet expectation.
			Enter valid Email and password with less than 6 characters	Sign up failed and display error message to user.	User received error message. Meet expectation.
TS02: Sign In/Login	TC02-1: Sign	User enter their Email	Enter valid Email	Login Successfully	User login successfully

	in/Login to an account	and password to login their account.	address and correct password.	and display Chatbot Main page.	and Chatbot Main page displayed. Meet expectation.
			Enter valid Email address and incorrect password.	Login failed and display error message.	User login failed and received error message. Meet expectation.
			Enter valid Email address and correct password but not yet verify account.	Login failed and display error message.	User login failed and received error message. Meet expectation.
			Enter invalid Email address format and correct password.	Login failed and display error message.	User login failed and received error message. Meet expectation.
			Sign In token not yet expired.	Direct user enters to Chatbot Main page.	Chatbot Main page displayed successfully. Meet expectation.
TS03: Facebook Login	TC03-1: Login with Facebook account.	User choose to login via Facebook.	User login to their Facebook app already.	Ask permissions from user and direct user to Chatbot Main page if grant permissions.	Successfully login and display Chatbot Main page. Meet expectation.
				Ask permissions from user and terminate login session if not grant permissions.	Successfully terminated login session for Facebook. Meet expectation.

			User haven't login to their Facebook app.	Display Facebook pop out window and ask user to login to their Facebook account first.	Facebook app login window pop out successfully. Meet expectation.
TS04: Google Login	TC04-1: Login with Google account.	User choose to login via Google.	User have login their Google accounts in their device.	Display a pop out window to let user to choose an account to login and display Chatbot Main page after choosing.	Successfully login after choosing an account and Chatbot Main page displayed. Meet expectation.
				Display a pop out window to let user to choose an account to login and terminate login session if user click outside the pop out window.	Successfully terminated login session for Google. Meet expectation.
			User haven't login any Google account in this device.	Display Google account login page for user to login with their Email and password. Display Chatbot Main page after successfully login Google account.	Successfully login after login Google account and Chatbot Main page displayed. Meet expectation.

TS05: Communicate with Chatbot	TC05-1: Make simple communications with Chatbot.	User type some simple messages or speak some simple sentences to Chatbot and get reply from Chatbot.	Ask Chatbot who is its developer.	Chatbot reply with correct message.	Correctly replied. Meet expectation.
			Make greeting with Chatbot.	Chatbot reply with correct message.	Correctly replied. Meet expectation.
			Ask for functions and services Chatbot can provide.	Chatbot reply with correct message.	Correctly replied. Meet expectation.
			Ask Chatbot to introduce itself.	Chatbot reply with correct message.	Correctly replied. Meet expectation.
TS06: Search Places	TC06-1: Make a request to search for places.	User type in or speak out some tags and Chatbot reply with tags associated places.	Make request that search for place based on type of place.	Chatbot reply with a nearest suggested place based on type of place.	Nearest suggested place based on type of place displayed. Meet expectation.
			Make request that search for place based on type of place and tag.	Chatbot reply with a nearest suggested place based on type of place and tag.	Nearest suggested place based on type of place and tag displayed. Meet expectation.
			Make request that search for place based on type of place and multiple tags.	Chatbot filter out type of place and reply with a nearest suggested place that meet most tags.	Nearest suggested place that meet most tags displayed. Meet expectation.
TS07: Route to Destination	TC07-1: Use route function.	User use route function to let Chatbot route user to destination.	User click on Route button.	Chatbot direct user to Google Map and route user to selected destination.	Google map successfully show the routing to the selected destination.

					Meet expectation.
TS08: View More Places	TC08-1: View more places.	User can choose to view more similar places.	User click on Looking for More button.	Chatbot display a list of similar places.	Successfully display a list of similar places. Meet expectation.
TS09: Rate Places	TC09-1: Rate for places	User can rate places based on their satisfaction.	Click on star image below Rate this to open rating scores dialog and select a score to rate.	Chatbot display rating scores dialog and store rating score into database after selecting a score.	Score successfully stored. Meet expectation.
			Same user rate on the same place multiple time.	Display message to inform user that they had already rated.	Successfully display the message. Meet expectation.
			Total number of rating value exceed set value.	Replace existing rating value getting from Google Map with the new rating.	Successfully replaced. Meet expectation.
TS10: View User Details	TC10-1: Admin login to Admin page.	Admin need to enter admin key to login to Admin page to use hidden functions.	Click on the Logo in Sign In page 5 times to open Admin login dialog and enter correct admin key.	Display Admin login dialog and enter to Admin page if admin key is correctly keyed in.	Successfully login to Admin page. Meet expectation.
	TC10-2: Admin try to view user details.	Admin select a user and view the user details.	Select a user and click on the detail button of the user.	Display a pop out window that show user details correctly.	Successfully pop out user details window and list user details correctly. Meet expectation.

TS11: Change Design Parameter	TS11-1: Admin change design parameter.	Admin has the ability to change the design parameter by changing values in Admin page.	Click on "SET VALUE" button to change design parameter values.	Display change design parameter page and update the values after changing the values and click on confirm button.	Design parameter values successfully changed. Meet expectation.
TS12: View Search Data	TC12-1: Admin view users search data.	Admin can view users search data in Admin page.	Click on "OVERALL" button to view overall search data.	Display a bar chart that shows overall search data.	Successfully display bar chart that shows overall search data. Meet expectation.
			Click on "BY DATE" button to view search data based on selected date range.	Display correct search data based on date range selected.	Correctly display search data based on date range selected. Meet expectation.
TS13: Self-Learning	TC13-1: System has the ability to add new tag based on user feedback.	System need to add new tag when meet the target.	User still have feedback chance and give a feedback with new tag.	System store the tag score if the place and store the new tag.	Tag score and new tag stored successfully. Meet expectation.
			User still have feedback chance and give feedback without new tag.	System only update the tag score to existing tag.	Tag score updated successfully. Meet expectation.
			User still have feedback chance and give feedback	System update the tag score and add the new tag to the place.	Tag score successfully update and new tag applied to the

			with new tag. The total number of the new tag meet the target value.		place. Meet expectation.
			User used up feedback chance.	System will not update any feedback data.	Feedback data not update. Meet expectation.

Table 7.3 Test Plan and Results table

✓

Chapter 8: Conclusion

8.1 Data Collected and Simple Analysis

After broadcasting the application to some testers and some real users, some data were collected from users and viewed through the Admin function. Some simple analysis is performed and displayed in bar chart format.

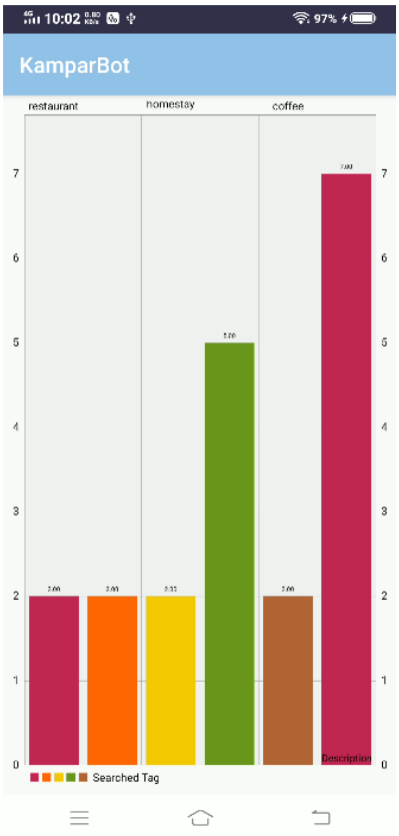


Figure 8.1 Bar Chart Result 1

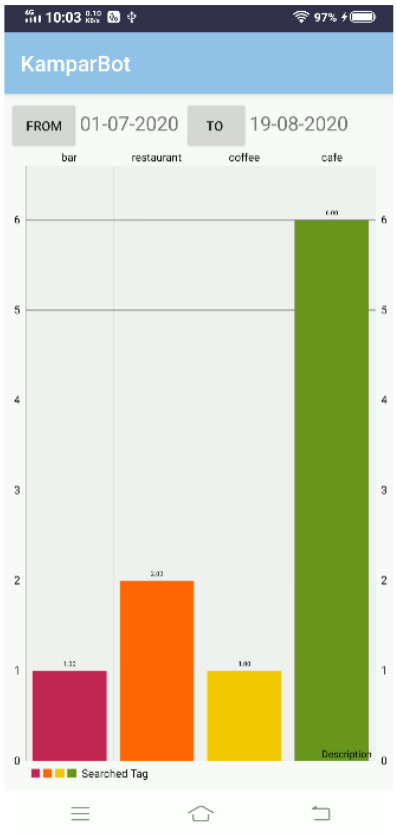


Figure 8.2 Bar Chart Result 2

From the above figures, it is obviously to conclude that most of the users and testers use Chatbot to search for Café to have Coffee. Another information that can be observe in the figures is that most of the users use Chatbot to search for foods. Thus, some improvement like adding more type of places based on food category into database can be made in future.

However, this analysis is meaningless because too less information is given. If more user information can be collected, more professional analysis can be easily performed.

8.2 Implementation Issues and Challenges

There are some implementation issues and challenges when developing the features of AI Chatbot. During the implementation of Voice Recognition feature, the API Level, RAM, and Processor of an android phone affect the performance of AI Chatbot. Some Facebook and Google services need to be updated in order to use it.

Some challenges like Hardware problem occurs during testing stage of KamparBot. Computer system specifications like Processor, Installed Ram, and Graphic Card Installed, will affect the testing of KamparBot in Android Studio. If the computer's system specification too low or does not meet the requirements, there is a risk of crash when running the AVD (Android Virtual Device) in Android Studio. This will slow down the entire testing stage of new feature in KamparBot. Another challenge is the details of places cannot be updated. Due to COVID-19, Malaysia government has limited people not to go out frequently, suggesting people stay at home. Many places did not open, thus cannot get the detail information about the places.

8.3 Future Work

This project haven't combined into GoKampar application as currently KamparBot is still an independent application. Combining KamparBot into GoKampar is one of the future works.

Due to COVID-19, some implementation of features such as detecting Weather and search more type of places will be the future work. Also, implement more detail information of places will be the future work too. More detail information such as Photo Gallery and opening hours of the places is one of the important and necessary work in the future.

Finally, increase user details is also an important work needed to do in the future. All tags and favourites data collected from user can generate greater analysis results if given user details is sufficient.

8.4 Project Review, Discussions and Conclusion

Through the development of proposed Voice Activated AI Chatbot, KamparBot can provide navigation service to users and also enables users to search places like café, restaurants, hotels, attraction and etc. KamparBot may help enhance the GoKampar user's experience in an easier way.

A lot of important and useful data wasted in Malaysia throughout years. This will cause a lot of economic losses in Malaysia. KamparBot can help collect tourist data while users use GoKampar to travel in Kampar or having conversation with KamparBot. The collected data is then store into cloud database for future use.

AI Chatbot was commonly used in many areas such as e-commerce, online banking and online shopping. Although there are AI Chatbot used in travel guide system, it is still not enough functions to satisfy tourist. KamparBot can provide more and more convenience functions, for example, Voice Recognition function, to satisfy users and this may help in increasing GoKampar user and also helps increase the number of tourists visit Kampar.

In conclusion, KamparBot can provide convenience for users when travelling in Kampar, thus can help to boost the reputation of Kampar in tourism industry and also collect tourist's data for future use.

REFERENCES

1. Expert System Team. (2018, July 17). Chatbot: What is a Chatbot? Why are Chatbots Important? Retrieved February 16, 2020, from https://expertsystem.com/chatbot/

2. Ayomide, S. (2017, December 8). Understanding the concept of AIML. Retrieved February 27, 2020, from https://medium.com/@shodipoayomide/https-medium-com-shodipoayomide-understanding-the-concept-of-aiml-adbc63e26da9

3. What is Data Mining? Definition of Data Mining, Data Mining Meaning. (n.d.). Retrieved February 27, 2020, from https://economictimes.indiatimes.com/definition/data-mining

4. Go Bentong, 2020. Mobile app. Version 5.1.1. Available from: <https://play.google.com/store/apps/details?id=trios.my.bentong> [Accessed: 5 April 2020].

5. Snaptravel, 2020. Mobile app. Version 2.0.1. Available from: <https://play.google.com/store/apps/details?id=com.snaptravel.core> [Accessed: 6 April 2020].

6. Expedia, 2020. Mobile app. Version 20.14.0. Available from: <https://play.google.com/store/apps/details?id=com.expedia.bookings> [Accessed: 7 April 2020].

7. JAPAN Trip Navigator, 2020. Mobile app. Version 4.7.0. Available from: <https://play.google.com/store/apps/details?id=jp.co.jtb.japantripnavigator> [Accessed: 8 April 2020].

8. Simpson, J. (2019, March 28). 5 Best Speech-to-Text APIs [Web log post]. Retrieved August 7, 2020, from https://nordicapis.com/5-best-speech-to-text-apis/

9. Dubrova, D. (n.d.). CHATBOT FOR TRAVEL INDUSTRY: BENEFITS, USE CASES, AND A DEVELOPMENT GUIDE [Web log post]. Retrieved August 7, 2020, from https://theappsolutions.com/blog/how-to/chatbot-for-travel-business/

10. Web Speech API. (2020, August 18). Retrieved August 20, 2020, from https://wicg.github.io/speech-api/#introduction

11. *Speech-to-Text: Automatic speech recognition | Google cloud*. (n.d.). Google Cloud. https://cloud.google.com/speech-to-text

12. Firebase guides. (n.d.). Firebase. https://firebase.google.com/docs/guides

Appendix A : WEEKLY REPORTS

FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: Y3 S1	**Study week no.: 4**
Student Name & ID: Ngui Miew Yiong 1803446	
Supervisor: Mr LIEW SOUNG YUE	
Project Title: THE DEVELOPMENT OF AI CHATBOT FOR KAMPAR TOURISM MOBILE APPLICATION	

1. WORK DONE

[Please write the details of the work done in the last fortnight.]

Start doing Google Login feature of this project.

2. WORK TO BE DONE

Make a group appointment every week.

3. PROBLEMS ENCOUNTERED

Feeling difficult to understand the Google Login Code.

4. SELF EVALUATION OF THE PROGRESS

Need to spend more time to learn more android coding.

Supervisor's signature

Student's signature

FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: Y3 S1	**Study week no.: 5**
Student Name & ID: Ngui Miew Yiong 1803446	
Supervisor: Mr LIEW SOUNG YUE	
Project Title: THE DEVELOPMENT OF AI CHATBOT FOR KAMPAR TOURISM MOBILE APPLICATION	

1. WORK DONE

[Please write the details of the work done in the last fortnight.]

Learn about Weather API through online.

2. WORK TO BE DONE

May think about is it necessary to put Weather API or not.

3. PROBLEMS ENCOUNTERED

For routing function, inside the Google Map already have Weather display, need to think about is it necessary or not.

4. SELF EVALUATION OF THE PROGRESS

Need to learn more coding about Weather API.

Supervisor's signature

Student's signature

FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: Y3 S1	**Study week no.: 7**
Student Name & ID: Ngui Miew Yiong 1803446	
Supervisor: Mr LIEW SOUNG YUE	
Project Title: THE DEVELOPMENT OF AI CHATBOT FOR KAMPAR TOURISM MOBILE APPLICATION	

1. WORK DONE

[Please write the details of the work done in the last fortnight.]

View More Similar Places function can extend to View All Places based on tags.

2. WORK TO BE DONE

Write coding to trigger the View All Places function.

3. PROBLEMS ENCOUNTERED

Need to find the proper position to put the coding.

4. SELF EVALUATION OF THE PROGRESS

Need to try out the coding first before implement into the app.

Supervisor's signature

Student's signature

FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: Y3 S1	**Study week no.: 9**
Student Name & ID: Ngui Miew Yiong 1803446	
Supervisor: Dr. LIEW SOUNG YUE	
Project Title: THE DEVELOPMENT OF AI CHATBOT FOR KAMPAR TOURISM MOBILE APPLICATION	

1. WORK DONE

[Please write the details of the work done in the last fortnight.]

Google Login function successfully implemented.

2. WORK TO BE DONE

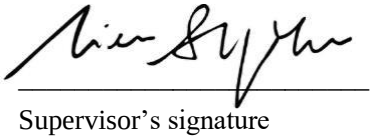
Need to solve the problem that cannot allow user to login with multiple platforms. (occurs if 1 Email address have logged in with Facebook, then the Email address cannot be used for Email password and Google Login)

3. PROBLEMS ENCOUNTERED

Facebook Login method is old one. Need to find a new one to replace.

4. SELF EVALUATION OF THE PROGRESS

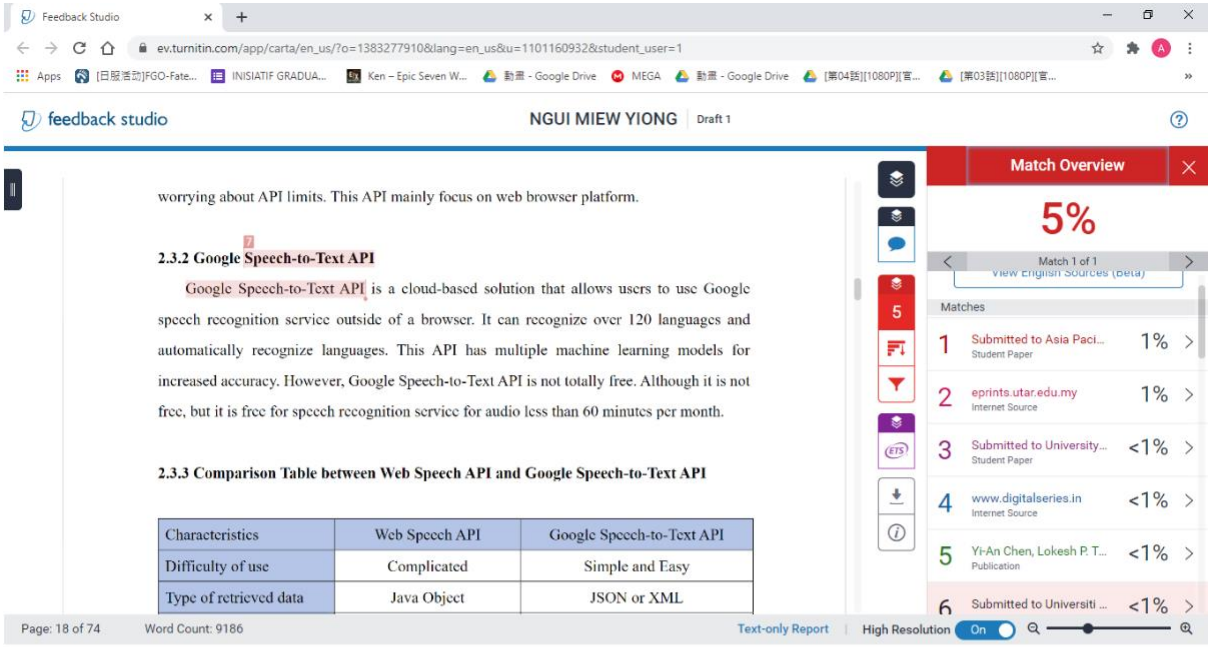
Implementing new method of Facebook Login needs time. May bring this problem to be solved in the future.

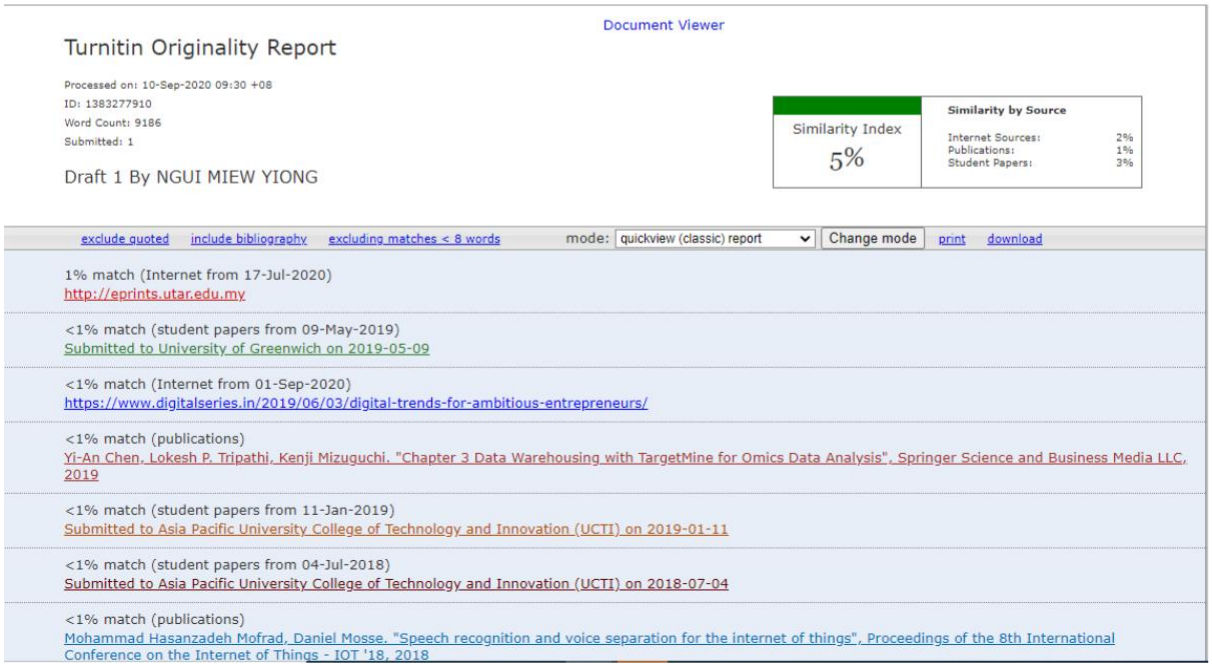


Supervisor's signature

Student's signature

Appendix B : TURNITIN RESULT





Faculty of Information and Communication Technology

THE DEVELOPMENT OF AI CHATBOT FOR KAMPAR TOURISM MOBILE APPLICATION

INTRODUCTION

Chatbot is a computer program than can act like a real human being by communicate with user. KamparBot is an AI Chatbot and also one of the features of GoKampar travel guide application. It provide lots of convenience services for user to search attractions, hotels and entertainments when travelling in Kampar. User data will be collected when user communicate with KamparBot or use the functions provided by KamparBot.

METHOD

DISCUSSION

This AI Chatbot covers most of the basic functionality from traditional travel guide app. It allow user to communicate with KamparBot by texting or talking. Not only that, it also allow user to search and navigate places easily. In future, this AI Chatbot can detect weather condition and provide most suitable suggestion to user. The development will also focus on data collection, which is very important for businesses to learn more about their customers and provide more effective strategies to improve tourism industry in Malaysia.

CONCLUSION

In conclusion, KamparBot is an effective travel guide application for boosting the development of tourism industry by providing convenience to user and also collect user data for businesses to do future analysis.

NGUI MIEW YIONG 1803446
SUPERVISOR: Dr. Liew Soung Yue

Universiti Tunku Abdul Rahman			
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ID Number(s)	1803446
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Title of Final Year Project	THE DEVELOPMENT OF AI CHATBOT FOR KAMPAR TOURISM MOBILE APPLICATION

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Based on the above results, I hereby declare that I am satisfied with the originality of the Final Year Project Report submitted by my student(s) as named above.

Signature of Supervisor

Name: Liew Soung Yue

Date: 10/9/2020

Signature of Co-Supervisor

Name: _____

Date: _____

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(KAMPAR CAMPUS)

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