MOBILE APPLICATION
OF
LOCATION POPULAR RESTAURANT
IN KUANTAN, PAHANG

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Bachelor Degree of Computer Science
(Graphic & Multimedia Technology)
with Honors

UNIVERSITI MALAYSIA PAHANG

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Thesis submitted in fulfillment of the requirements
for the award of the degree of
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ABSTRAK

Pada masa kini, telefon pintar telah menjadi satu keperluan yang sangat berguna kepada masyarakat. Hampir semua orang mempunyai telefon pintar sendiri walaupun harganya tidaklah terlalu murah dan tidak mahal. Tambahan pula, kini telefon pintar mempunyai pelbagai fungsi dan keistimewaan yang tersendiri seperti mudah untuk mencari informasi bila-bila dan dimana sahaja berbanding menggunakan yang lain. Selain daripada itu, GPS, fungsi AR dan Wi-Fi telah diciptakan didalam telefon pintar. Kelebihan ciri-ciri ini sangat sesuai dengan projek ini yang menggunakan navigasi lokasi. Tambahan pula, pada masa kini, negara kita semakin pesat dan membangun yang meyulitkan orang untuk mencari sesuatu lokasi terutamanya pada lokasi yang menggunakan jalan sehala. Oleh itu, applikasi ini membantu user untuk mendapatkan navigasi yang tepat terutamanya lokasi restoran. Kebanyakkan daripada applikasi yang telah wujud, ianya hanya letak informasi lokasi sahaja. Ia menyukarkan untuk mencari lokasi terutamanya nagara yang menggunakan jalan sehala seperti Kuantan. Jika user terlepas lokasi sesuatu tempat, ia menyukarkan untuk patah balik kerana tidak mempunyai jalan untuk pusing balik. Aplikasi ini sangat sesuai kepada pelancuing yang melancung ke Kuantan dan pelajar yang belajar di Kuantan kerana mereka tidak biasa dengan jalan di Kuantan. Tujuan projek ini adalah untuk membuat satu aplikasi tentang restoran yang menarik dan popular yang terdapat di Kuantan kepada pelancung yang melancung ke Kuantan. Metodologi yang digunakam didalam projek ini adalah Waterfall modal yang mempunyai jenis keperluan seperti Analisis keperluan, reka bentuk, perlaksanaan, pengesahan dan penyelenggaraan. Output bagi aplikasi ini ialah untuk memaparkan peta dengan fungsi navigasi kepada pengguna ke tempat makanan yang dipilih. Aplikasi ini diharapkan dapat berfungsi sebagai fungsional dan menyediakan maklumat berguna kepada pengguna yang melancong ke Kuantan, Pahang. Akhir sekali, gabungan multimedia seperti imej, teks dan bunyi telah dipilih untuk digunakan didalam projek ini untuk menarik minat lagi pengguna terhadap aplikasi ini.

ABSTRACT

Nowadays, smartphones have become a very useful requirement for society. Almost everyone has their own smartphone and still affordable to have it although the price is not too cheap and not expensive. Furthermore, smartphones now have their own unique functions such as easy to search the information any time and everywhere compare to other. Other that, GPS, AR feature and Wi-Fi also have in feature of smartphone. This feature is suitable with this project which is using location navigation. In addition, nowadays our country was growing rapidly and make difficult to find curtain location because of the road factor especially the place that use the one-way road. This mobile application can help user get the right location navigation especially for the restaurant location. Most of the application are not have location navigation. Their just put information of the location. It gets hard to find especially for country that have using one-way road like Kuantan. If the user missed the place, it hard to go back because don't have u turn way. This application is suitable to the tourist that travel in Kuantan and student who studying in Kuantan because they are not very familiar with the way in Kuantan. The purpose of this project to create an application of the popular and interesting restaurants in Kuantan for tourist that travel in Kuantan. The methodology that will be use in this project is waterfall model which include requirement analysis, design, implementation, verification and maintenance. The output of this application is to display the map navigation function of location user to the location restaurant popular in Kuantan. This app is expected to function as functional and provide useful information to users traveling to Kuantan, Pahang. Finally, multimedia combinations such as images, texts and sounds have been selected for use in this project to attract more users to this application.

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LIST OF ABBREVIATIONS

Chi	China Language
Eng.	English Language
Fran	Francis Language
GPS	Global Position System
Ital	Italian Language
JSON	Java Script Object Notation
POI	Point of Interest
Po	Portuguese Language
UAT	User Acceptance Test
Q1	Question 1
Q2	Question 2
Q4	Question 4

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

Nowadays, mobile phone is known as the smartphone and also becomes a mandatory requirement for all individuals. Mobile phones not only work to make calls or send a message, but also have many other specifications and features such as camera, Global Position System(GPS), Wi-Fi, sensor function, high processor and others. With these specifications and features, smartphones become a suitable and powerful platform to implement a mobile application of location popular restaurant in Kuantan, Pahang. In addition, according to research studies, 70 percent of teens aged 13 to 17 now use smartphones and 79 percent of young adults between the ages of 18 and 24 own a smartphone (Nielsen,2014).

Basically, mobile application was built to solve problems and making life much easier. The smartphones itself are easily to carry and access compare to personal computers that much bigger and expensive than a smartphone. Besides, the function of the personal computer is much likely as same as the smartphones. This shows that smartphones are most useable gadgets that can be done anything through smartphones. In addition, a Global Positioning System (GPS) navigator device has been replace by the mobile gadget as well. This is due to the importance of the location information that helps new tourist to explore the surroundings and searching for a specific location.

Figure 1: Example of mobile application location navigation

To help the tourist explore the surrounding, the mobile application that using location navigation will be develop. The purpose of this mobile application is to delivers tourist information and let user explorer the best restaurant in Kuantan, Pahang. In addition, in this project also provide information of the restaurant such as the menu, business hour, type of cuisine and call number of the restaurant. This application will be classified to point of interest (POI) and navigation to give the user the best proficient to find the places.

1.2 PROBLEM STATEMENT

Kuantan has many of restaurant infrastructure that consists of the different type of food and different place. Therefore, new people who visit for the first time may have a hard time to find a good place to eat for dinner, lunch or breakfast because they are still not familiar with the surroundings of Kuantan city especially for the tourists and student who is from out of Pahang. Beside, infrastructure in the Kuantan are rapidly expanding every year.

In addition, most of existing applications do not provide navigation. The display maps only show the location of the food place without navigating user to get there. There are also some applications that provide user with almost complete information for example the 'Kuantan Map Offline' app. However, the application is not free to use it, user must pay to get the full version for more information of the restaurant. Other than that, the exist mobile application is not up-to-date. Some of the restaurant those not exist anymore.

Therefore, with these mobile application, it can provide the solution of the current problem. This mobile application can give user more up-to-date information about the place of popular restaurant in Kuantan, Pahang. Next, this mobile application also gives map navigation from user location to the restaurant places that user chooses.

1.3 OBJECTIVE

- To find the system requirement for popular restaurant in Kuantan, Pahang.
- To develop and implement a mobile application using map navigation for the visitors in Kuantan on Android platform.
- To test the usability and effectiveness of the mobile application

1.4 SCOPE

This mobile application is used android system as the platform to develop the project. The project consists of navigation concept using mapbox to find the location of the popular restaurant. The target user of this application is tourist that visited in Kuantan and also student that study in Kuantan to help them go to the best restaurant in Kuantan, Pahang.

1.5 THESIS ORGANIZATION

This thesis consists of five chapters. Chapter 1 is the introduction of this project, which briefly explain the scenario state of current technology, it also states the problem statement, objectives, and scopes.

Chapter 2 presents the literature review, which contains the general information about the study of this project and briefly explains the hardware/ technologies/methods/techniques that will suitable to use in this project. This chapter will also make a comparison with three existing systems to find the existing problem and solution that proposed by others.

Chapter 3 (Methodology) will discuss the overall approach and framework of the research. This chapter will explain the methodologies of the system and the tools and techniques that will be used in the implementation phase.

Chapter 4 (Implementation and Result) will describe the procedure of the development of the system and explanation of the tools and techniques that use in this phase. This chapter also defines the sample data and the outcome of the system by testing the system.

Chapter 5 is the conclusion which contains the conclusion of the research.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter contains the review and information of the existing system and comparison are made based on the existing system to seek for the limitation and solution proposed by others. This chapter will also briefly explain the hardware/ technologies/methods/ techniques that suitable to implement in this project.

There are many kind of mobile application such as native application, web application, and hybrid application. Three type of this application have their own advantages and disadvantages. In mobile development section, native application is developing the app using the programming language and interface for a specific operating system and device (Amrhein, Mirman, & Ishay, 2013). For the web application, it is just a web browser that delivers through mobile device and for the hybrid application, it compromises between native and Web. The hybrid application develops in industry-standard Web programming languages, such as HTML5 and JavaScript, then package in a natively installable format for app store distribution (Maribel, 2014). It is actually save cost with reusing the codes.

2.2 RELATED PROJECT

2.2.1 Find Restaurant Near Me

Find Restaurants Near Me is a mobile application that searches and navigates nearby hotels, bars, fast food around the user location. It will auto detect the user location by the GPS. This mobile app have eight categories available which is Bar, Cafe, Fast Food, Liquor Store, Meal Delivery, Meal Takeaway, Restaurant Bakery Works for any city in the world. The feature of this mobile app is it can work even without GPS.

Feature:

- This mobile application can work even without GPS by detecting mobile tower location
- Show the navigation of the restaurant from the user place

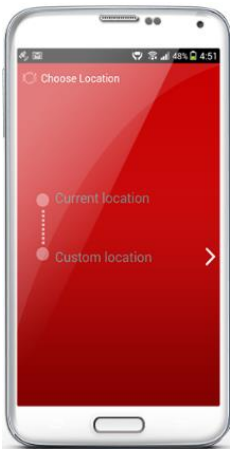


Figure 2.1: Homepage interface of Find Restaurant Near Me application

Figure 2.2: Categories restaurant interface of Find Restaurant Near Me application

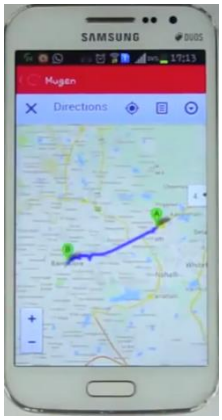


Figure 2.3: Map interface of Find Restaurant Near Me application

2.2.2 Kuantan Map Offline

Off-line map of Kuantan (Malaysia) is a free travel application that have map out the route, show sight-seeing attractions with photos and description and find the nearest coffee shop or supermarket. This mobile application feature is user can use this app even though does not internet connection. However, to get the more feature or full version user must pay to buy this application to used it.

Feature:

- All function of this mobile app work perfectly without using internet such as off-line map of Kuantan, off-line POI search and also can add locations to your favourites.
- Have map navigation from user place to the tourism place, convenient interface and also free map updates.
- Have photos and description of the tourism place in the map by click (tourist mode).

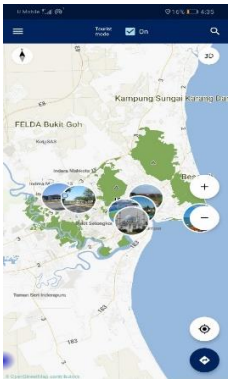


Figure 2.4: Homepage Kuantan Map Offline application

Figure 2.5: Detail place interface of Kuantan Map Offline application

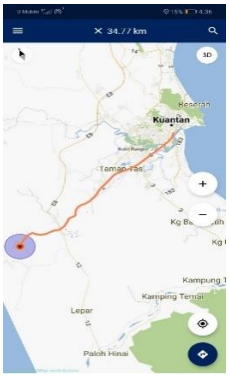


Figure 2.6: Navigation interface of Kuantan Map Offline application

2.2.3 Malaysia Travel Guide by Triposo

The Malaysia travel guide contains complete and up to date city guides for Kuala Lumpur, Kota Kinabalu, Kuching, George Town and many other travel destinations in Malaysia. It works offline, user don't need an internet connection. Each location contains a sightseeing section with all the monuments. Pick your ideal restaurant in the eating out section containing the best restaurants. Discover the nightlife of Malaysia! Bars, pubs & discos in Sandakan, Genting Highlands, Kuantan, Kuala Terengganu. Use the detailed offline maps to simply find out where you are and see what's around. This application also comes in IOS platform.

Feature:

- This application have phrasebook for Malay language that function easy to foreigner tourist translate some word in English to Malay.
- This app also have Weather forecast (updated when online).
- Directions on how to get to a place by public transport.
- When using this application, user also can book hotels and tours in Malaysia directly from the app (when online).

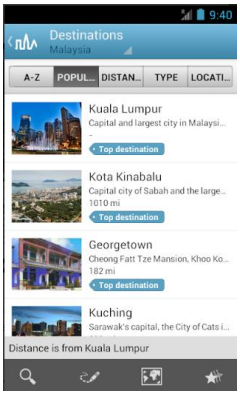


Figure 2.7: Name location interface of Malaysia Travel Guide application

Figure 2.8: Map interface of Malaysia Travel Guide application

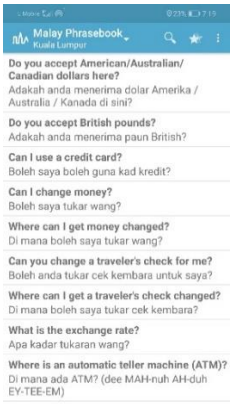


Figure 2,9: Phasebook interface of Malaysia Travel Guide application

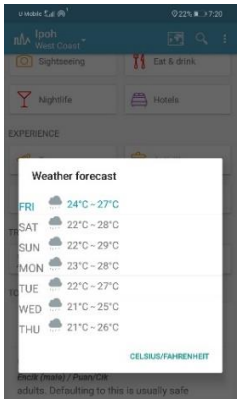


Figure 2.10: Weather interface of Malaysia Travel Guide application

2.3 COMPARISON OF EXISTING SYSTEM

Table 2.1: Comparison of existing system

FEATURE	MOBILE APPLICATION		
	Find Restaurant Near Me	Kuantan Map Offline	Malaysia Travel Guide By Triposo
Android	✓	✓	✓
IOS	x	x	✓
Location Navigation	x	✓	x
Detail Location	x	PAY FOR FULL VERSION	✓
Sound	x	x	x
Language	E	Eng., Fran, Ital, Po, Chi	E
Rating/ Comment	x	x	✓
Filter Data	x	x	✓
Nearby Place	✓	x	✓
Offline Map	x	✓	x
Price	FREE	FREE	FREE

The relevance of comparison between the existing systems are the most of the application used Android platform but also have some of them have used in both platforms which is in Android platform and IOS platform. This shows that Android is the most one popular platform that developer used to create the application. Two of the tree existing system does not have navigation location. However, Malaysia Travel Guide By Triposo application having location navigation for help user to know direction to go to the location of the restaurant. Besides, free of charge of using the location navigation is more attract interest for the user to get the information using this mobile application. Other than that, rating or comment part is very important for the user to rate the restaurant especially for the mobile app of location popular restaurant. It helps tourist from out of Pahang to make the decision to go to the good restaurant and it will affect Pahang country with the positive comment about the good restaurant. Next, the part of detail location is the most mobile application used because that function is to give more detail about that place for the user and make more feature to the application.

2.4 FURTHER OUTLOOK

In this chapter, different type of existing systems is discussed on its features and reviews in detail. The different system had its own useful features and limitation, this information that obtain will become the guide line or guidance for Location Popular Restaurant in Kuantan, Pahang

CHAPTER 3

METHODOLOGY

3.1 INTRODUCTION

The methodology is an important phase, which acts as an implementation guideline to carry out the project in an effective way. It is defined as the theoretical analysis phase in the development of the project, which requires time and effort. In this chapter, the methodologies, tools, and techniques that will be used in the implementation phase will be briefly discussed. The methodology for developing this application is Waterfall model.

3.2 METHODOLOGY

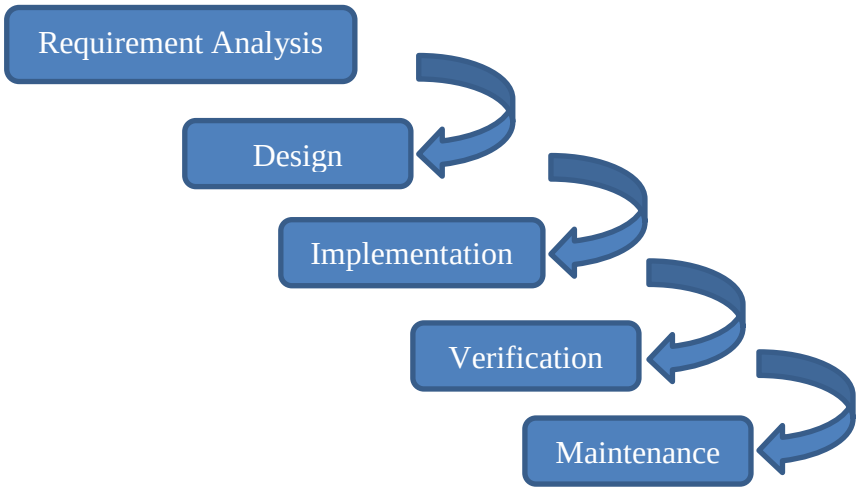


Figure 3.1: Waterfall Method Model

The project decided to use Waterfall methodology because it is most popular and widely used in the systems development life-cycle model. Waterfall methodology also easy to understand and easy to use it. It is a linear-sequential life-cycle model. Therefore, no phase will work overlapped in each phases because each phase in waterfall model must

be fully completed before move forward to the next phase. In addition, Waterfall methodology is suitable for a project that does not require a large numbers of developers.

3.2.1 REQUIIREMENT ANALYSIS

During this stage, all the user requirement needed will be collected by survey. The developer will be investigating on what the respondent give respond to implement the good thing into the mobile app. To get the responding from survey, the survey was spread to the student at university and tourist that travelling to the Kuantan at Shopping Mall. Other than that, observation also is used to do requirement analysis. The developer will observe every restaurant in Kuantan to choose the best restaurant for the user. Through observation, data can be collected regardless anywhere and anytime as long as the targeted object is existing. Lastly, secondary data via internet is also used to collect the requirement analysis. The advantages of this method is we can get the information quickly and have lower costs than spread the survey.

1 USER REQUIREMENT

- Observation

Observation is the highly important method in data gathering. Observation data is reliable as the data is gained without relying on people's willingness or ability to provide information. This method data collection is applied for gathering data from restaurant like the location, open hours, the services and the menu served. This is done by jotting down the restaurant detail or take the picture. This way of data collecting is much more convenient and time saving.

Figure 3.2.1: Detail of opening hour KRIM restaurant at the door

Figure 3.2.2: outside the KRIM restaurant

Figure 3.2.3: The menu of KRIM restaurant

- Survey Analysis

To do analysis of user requirement, I used survey analysis to get information and produce the overall idea of the project. There are three question have been provided in the survey. I choose Kuantan student and tourists that travelling in Kuantan to give the respondent to the questionnaire. The number of respondent is 13 people.

a) Did you know popular restaurant in Kuantan?

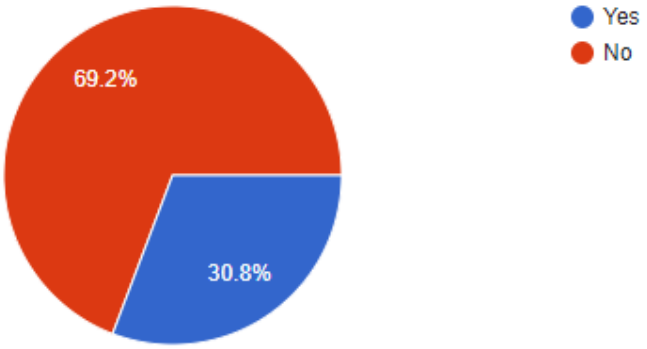


Figure 3.2.4: The percentage of people know the popular restaurant in Kuantan

Figure 3.2.1 shows that most student or tourist does not know the popular restaurant in Kuantan. However still 30.8% of responded know the popular restaurant. The respondent that answer 'yes' showing student who studying almost third year in Kuantan and know a little bit about Kuantan or tourist who always travel to Kuantan. They might be get information with old friend in Kuantan or family who stay in Kuantan. As conclusion, this mobile application of Location Popular Restaurant in Kuantan, Pahang is alternative for people who want to travel in Kuantan and same time help student to get breakfast, lunch or dinner at popular and best restaurant in Kuantan.

b) How did you find way to go specific location?

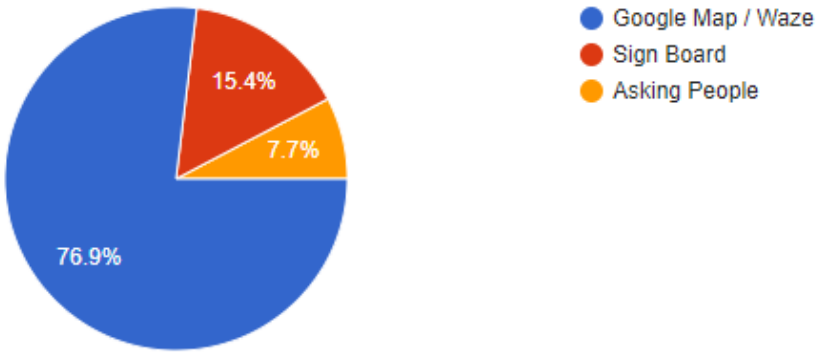


Figure 3.2.5: The percentage of what the people use to go specific location

Figure 3.2.2 shows 76.9% responded use google map or Waze, 15.4% use sign board and 7.7% asking people to go for specific location. This result shows most of student or tourist travel in Kuantan by using Google Map or Waze. This result also shows the tourist still using signboard to find the place because might be the certain place are not in Google Map or Waze. In addition, the new place is still not up to date in the Google Map or signboard. Other than that, the respondent also asking people to go the specific location because of the old place especially rural area. In conclusion, this navigation will implement in this project to get more interesting of application. The purpose of location navigation is easy for user to go from the current location to the location restaurant. In additional most existing system are not have location navigation. The display maps only show the location of the food place without navigating user to get there

c) Did you often use google map or waze to find the location?

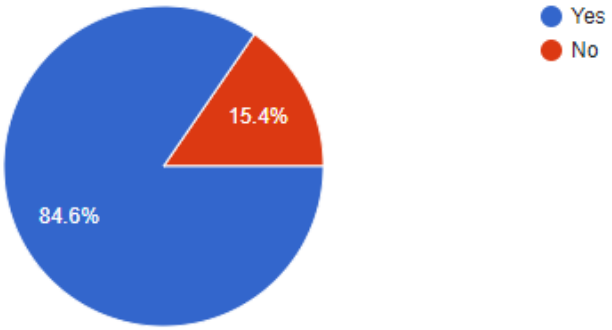


Figure 3.2.6: The percentage of frequency people are using Google Map or Waze

Figure 3.2.3 is show 84.6% of student and tourist are often using Google Map or Waze. However, 15.4% of student and tourist does not use Google Map or Waze to find the location. The respondent that said 'no' might be not using a smartphone that does not have Google Map or Waze. Other than that, the result show most of respondent like to use Google Map or Waze. This is because it makes easy for student or tourist who first time travelling in Kuantan to go to the location. In addition, this Google Map or Waze can save time to search the location of the place. In conclusion, when more people are often use the google map, it can make easier for them to use my mobile application because my application also have implement location navigation like Google Map or Waze.

- Internet Analysis

Second method to do user requirement is internet analysis. This method basically is existing information that have been collected for another purpose. This project used internet sources to obtain information of the restaurant, type of cuisine for each restaurant and the rating and comment that customer give for each restaurant.

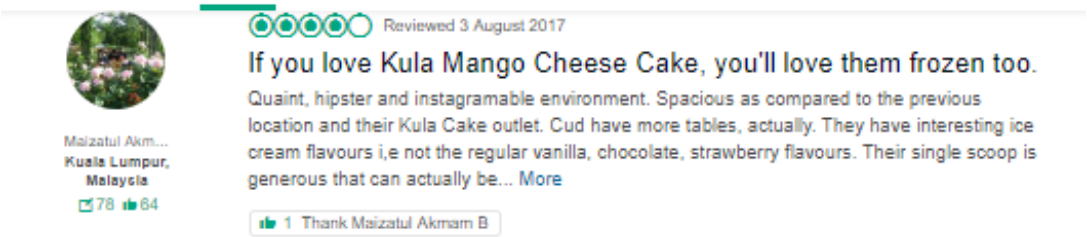


Figure 3.2.7: Review customer from internet sources

2 FUNCTIONAL REQUIREMENT

a) Point of Interest (POI)

A point of interest, or POI, is a specific point location that someone may find useful or interesting. The system should detect the geolocation information of the user and the geolocation of the POI data.

b) Map View

Map view is a web mapping service developed by Google. It offers satellite imagery, street maps, 360° panoramic views of streets (Street View), real-time traffic conditions (Google Traffic), and route planning for traveling by foot, car, bicycle (in beta), or public transportation. Map view are using GPS system.

c) Navigation walk mode

Navigation walk mode is a field of study that focuses on the process of monitoring and controlling the movement of a user or vehicle from one place to another. The system should identify the destination that is selected by the user.

3 SYSTEM REQUIREMENT

Hardware 1: Acer Aspire V3-471G

Table 3.1: Hardware 1 specification

Main Features	Description
Model	Acer Aspire V3-471G
Operating System	Windows 10
Processor	Intel® Core™ i5-3210 CPU @2.50GHz

Storage	1TB HDD
System Type	64-bit operating system
Display	14.0" HD LED-Backlit (1366 x 768)
Graphic	NVIDIA GeForce GT 630M
Memory	6.00 GB(DDR3)- RAM
Dimensions	343 x 245 x 33.4mm

Hardware 2: Huawei Nova 3i

Table 3.1: Hardware 2 specification

Main Features	**Description**
Dimension	157.6 x 75.2 x 7.6 mm
Display	IPS LCD capacitive touchscreen, 16M colours
Operating System	Android 8.1 (Oreo)
Chipset	HI silicon Kirin 710 (12 nm)
Memory	Card Slot: micro SD, up to 256 GB Internal: 128 GB, 4 GB RAM
Battery	Non-removable Li-Ion 3340 mAh battery

Table 3.2: Functionality of Software

Software	Purpose
Android Studio	To develop the mobile application
Adobe Photoshop CS6	Designing the markers and logo
Microsoft Word	Use for documentation work
Gantt Pro	To develop the Gantt chart

3.2.2 DESIGN

During this stage, the overall architecture of the system design and the transition of the system will be discussed in detail which will be used. In addition, this stage is where the input, output, database and forms are drawn up in detail and also the programming language is decided. The storyboard is a continuous interactive process that allows developer to understand, modify and approve a working model of the system that meets their needs. The information from analysis requirement will be used at this stage to help developer design the mobile application.

1 FLOW CHART

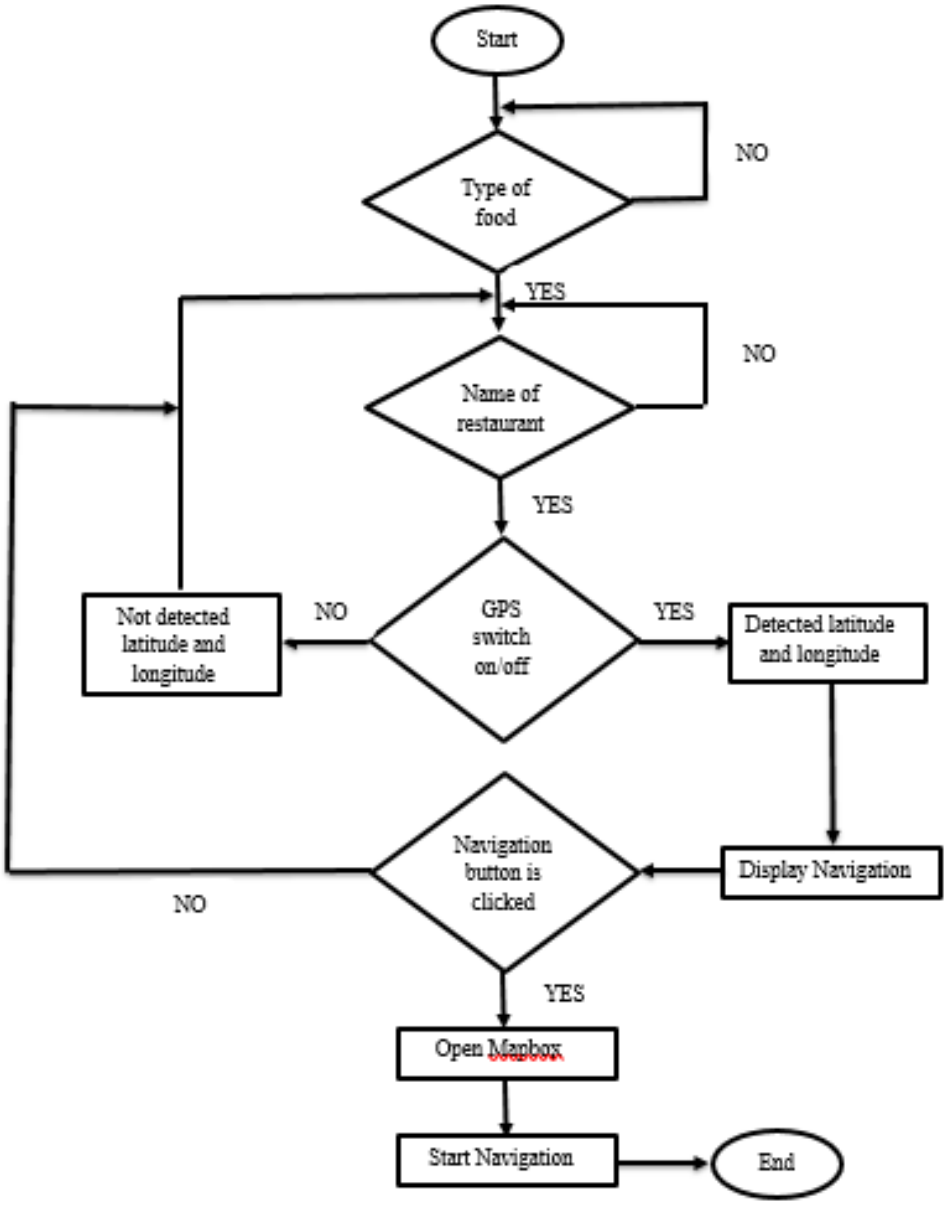


Figure 3.2.8: Flowchart of using navigation location

Figure 3.2.8 shows the flowchart of using navigation location. The mobile application will display (homepage) and ask user to click button ‘start’ to go to the next scene. In

next scene, user can choose the type of food button or back to the homepage. If the user clicks one of the type food button, the scene will change to the (name of restaurant) scene and it will display many button of name restaurant. User can choose which one restaurant they want to go or back to the (type of food) scene. If user click one of the name restaurant button, the scene will change to the (map) scene. At the (map) scene, the application will display the permission to detect the user location. If user allows, the application will detect the latitude and longitude user and it will display the navigation from user location to the restaurant location and it will display 'start navigation' button to go to the (Navigation) scene. In (Navigation) scene, the navigation location will show the right way to go to the restaurant. User will exit and end the application.

2 CONTEXT DIAGRAM

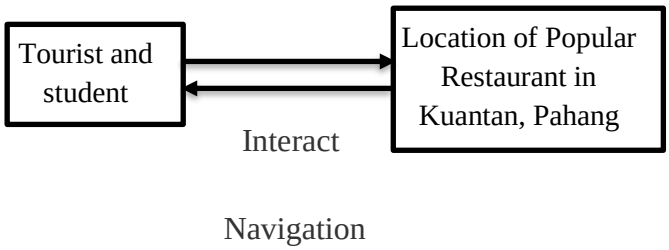


Figure 3.2.9: Context Diagram of mobile application

Figure 3.2.9 shows the context diagram of mobile application. The user of this mobile application is student that study in Kuantan and tourist that travelling in Kuantan, Pahang. The user will interact with the mobile application of Location Popular Restaurant in Kuantan, Pahang. The output for the user is navigation from user location to the restaurant location using map.

3 USED CASE DIAGRAM

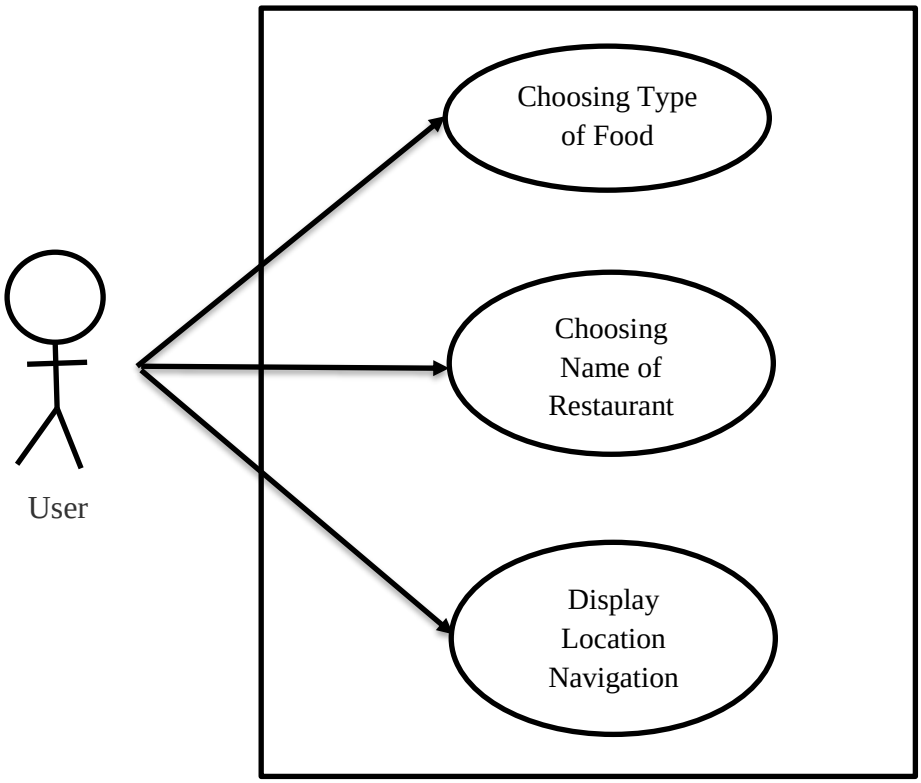


Figure 3.2.10: Use Case Diagram for mobile application

Figure 3.2.10 shows the use case diagram for mobile application. The actor is tourist that travelling in Kuantan and student who study at Kuantan. The actor will start the application. They will choose type of restaurant and choose name of restaurant. The application will display the navigation from user location to the restaurant location.

Used Case Name	Choosing type of food Choosing name of restaurant Display navigation location
User	Tourist that travelling in Kuantan and student who study at Kuantan
Flow of events	1. User search destination using map view 2. User choose the categories of the destination 3. Map view will display all name restaurant that matching categories 4. User choose the destination 5. Map view will display navigation through mapbox 6. User can click the marker in map to get more detail about destination
Alternative flow	Alternative: map display navigation 1.Click button start navigation 2.Click marker to get more information
Precondition	User must switch on the location services to detect the latitude or longitude the location of the user

4 STORYBOARD

Graphic: Logo company

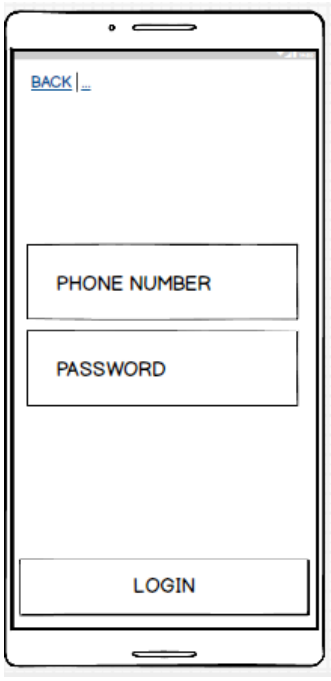
Animation: None

Audio: None

Interactivity: login and signup button with different functionality

Description: This is home page that will be display for user. By clicking login button it will go to the login interface. Other that, when user clicking signup button, it will go to the signup interface

Figure 3.2.11: Home Page interface



Graphic: None

Animation: None

Audio: None

Interactivity: login button, User input phone number and password

Description: When user click button login, it will go to main page interface. The phone number and password data that user input will read from the database. Other that, at the above screen have back button. When clicking the back button, it will go to the home page interface.

Figure 3.2.12: Login interface

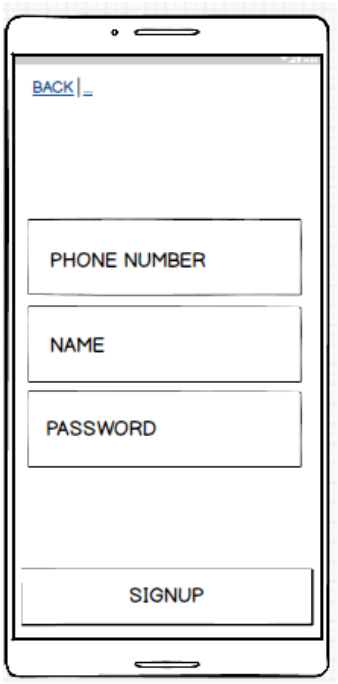


Figure 3.2.13: Signup interface

Graphic: None

Animation: None

Audio: None

Interactivity: login button, User input phone number, name and password

Description: When user click button signup, it will go to login page interface. The phone number, name and password data that user input will add to the database. Other that, at the above screen have back button. When clicking the back button, it will go to the home page interface.

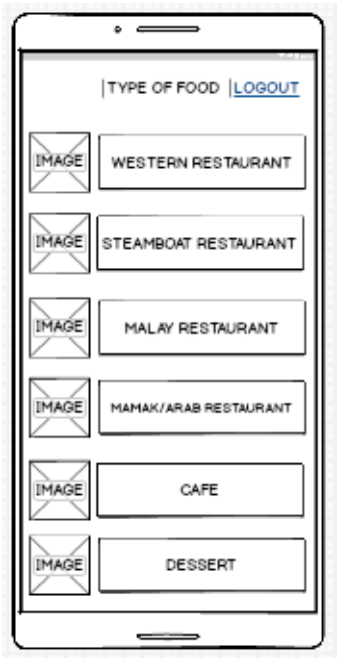


Figure 3.2.14: Main Page interface

Graphic: Image western food, image steamboat food, image malay food, image mamak food, image dessert food, image food in café.

Animation: None

Audio: None

Interactivity: Six button with different functionality

Description: This is main page that will display for user. By clicking western button, it will show the name of restaurant that have western food. Next, by clicking steamboat button it will show the name of restaurant that provide steamboat food. It same like malay button, mamak, café and dessert. Other that, at the above screen have logout button. When clicking the logout button,it will go to the home page.

Figure 3.2.15: Name restaurant interface

Graphic: None

Animation: None

Audio: None

Interactivity: Different name of restaurant button with different functionality

Description: This is name of restaurant page that will display for user. By clicking name of restaurant button it will go to the detail restaurant interface to get information of the restaurant. Other that, at the above screen have two button which is logout button and back button. When clicking back button, it will go to main page and when clicking logout button, it will go to home page.

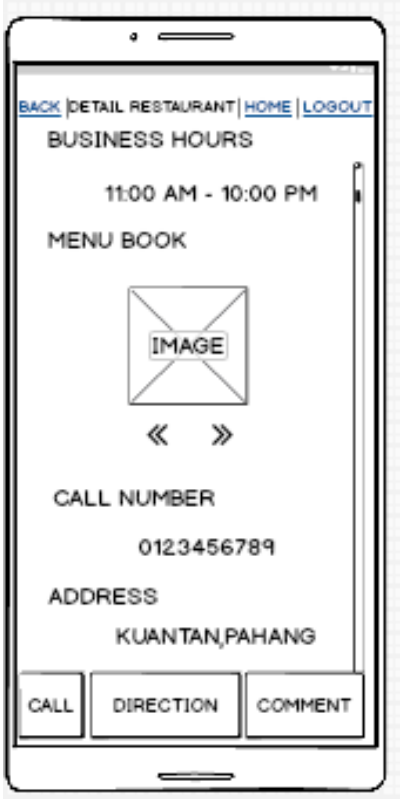


Figure 3.2.16: Detail restaurant interface

Graphic: Menu Book

Animation: None

Audio: None

Interactivity: Different name of restaurant button with different functionality

Description: This is detail of the restaurant. There are 2 button at book menu which is back and next button. When user click button back, it will display previous book menu and when user click button next, it will display next book menu. Other than that, there are 3 button at the bottom screen which is call button, direction button and comment button. When click call button it will go to dialler phone. When click direction button, it will go map interface and when click comment button, it will go rating restaurant interface. In addition, at the above screen have two button which is logout button and back button. When clicking back button, it will go to name restaurant interface and when clicking logout button, it will go to home page.

Figure 3.2.17: Map interface

Graphic: Marker location restaurant

Animation: None

Audio: Map

Interactivity: Start navigation button

Description: This is map page that will display for user. By clicking start navigation button it will start navigate from user place to restaurant place. Next, when user click marker in the map, it will go to detail restaurant interface. Other that, at the above screen have two button which is home button and back button. When clicking back button, it will go to detail of restaurant interface and when clicking home button, it will go to home page.

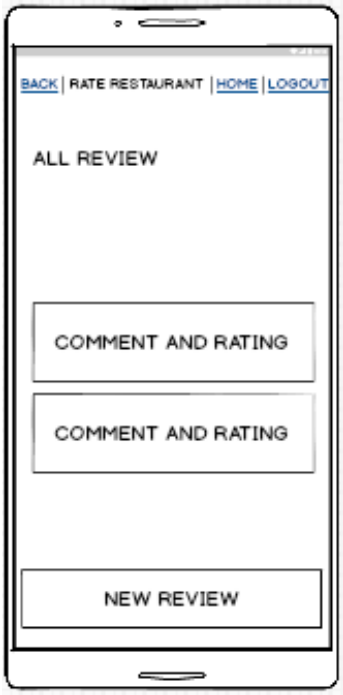


Figure 3.2.18: Rating restaurant interface

Graphic: None

Animation: None

Audio: None

Interactivity: New Review button

Description: This is rating restaurant that display rating of the restaurant. When user click the new rating button to give rating, it will pop up the dialog box interface. Other that, at the above screen have two button which is home button and back button. When clicking back button, it will go to detail restaurant interface and when clicking home button, it will go to home page.

Figure 3.2.19: New rating interface

Graphic: None

Animation: None

Audio: None

Interactivity: Submit and Cancel button

Description: This is dialog box page that will display for user when user give the rating when click star button at detail restaurant interface. User can give the comment about the application at comment here! space. Other that, when user click submit button, it will save the comment to database and go back to rating restaurant interface. When user click button cancel button, nothing will happen but it will go back to the detail restaurant interface.

3.2.3 IMPLEMENTATION

Implementation phase where the coding is started to fully implement the application. For this project, the coding part is done by using Android Studio as a platform to develop the mobile application. Other than that, a prototype is developed to test the functionality, assumptions and helps to give an understanding of the work scope.

1 ADOBE ILLUSTRATOR

All the image and graphics that need to be implement in the application have been created and edited using this Adobe Illustrator software. This software allowed the image and graphics to be save in PNG formats and transparent background. First design using this Adobe Illustrator is the design name for mobile application. The design will save in PNG format and will insert into android studio to be the logo of the application.

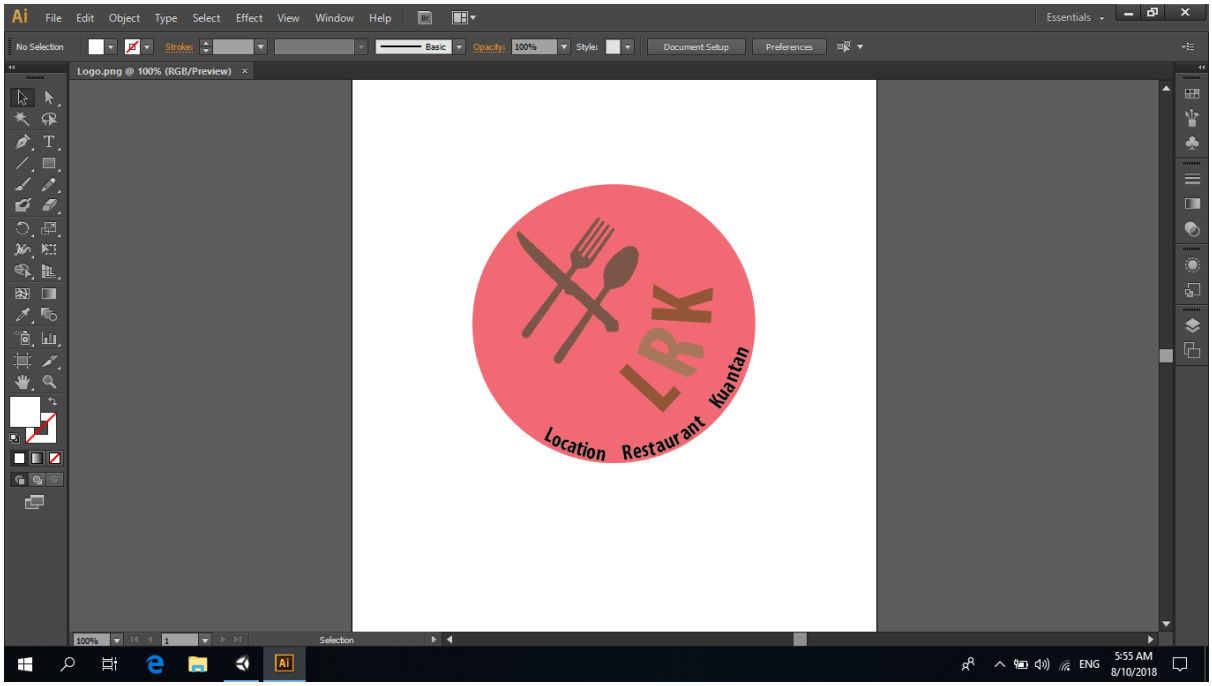


Figure 4.1: Logo application

2 ANDROID STUDIO

Android studio is the most common software to develop mobile application as it provides the fastest tools for building apps on every type of Android device. It is available for download on Windows, macOS and Linux based operating system. Figure 4.2 until Figure 4.7 below shows the thing that will implement to develop the mobile application of Location Popular Restaurant in Kuantan, Pahang.

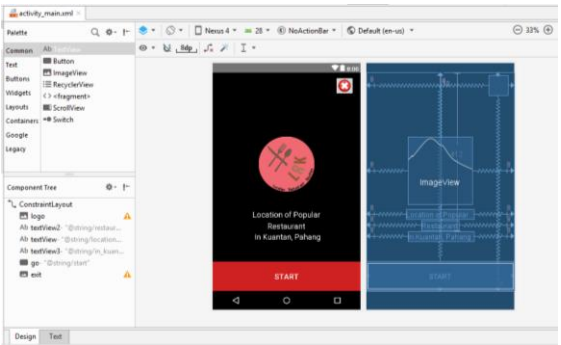


Figure 4.2: The home page scene

Figure 4.2 shows the home page interface of mobile application. For the home page scene, the logo from android illustrator will be import to make the tittle logo. To implement the image to the mobile application, the image must be save in drawable file that have in the android studio software first. After that, choose ImageView component and set it with the logo in drawable file. This image also will be the logo of the app. Figure 4.3 above shows the image from drawable being the logo of application. To implement the image being the logo of application, the coding must put in the manifest file into AndroidManifest.xml.

Figure 4.3: Logo of mobile application in screen phone

Coding part of logo application:

```
<application
   android:icon="@drawable/logo"
   android:label="LocationPopularRestaurantInKuantan"
   android:roundIcon="@drawable/logo"
</application>
```

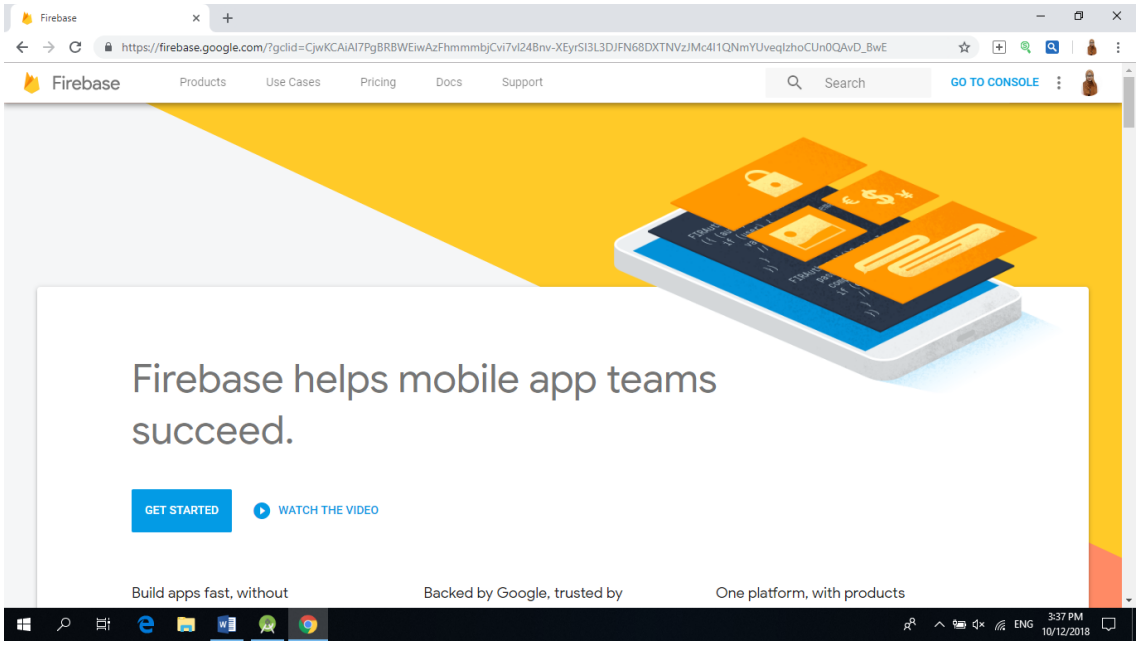


Figure 4.4: Firebase website

Figure 4.4 is the website of the database. This mobile application is using firebase to develop the database. To use this firebase, it must download the json file and copy to the app file into the project. However, to download the json file, it must register name project of android studio into the firebase website first before download. The step to use this firebase are in below.

Step1: Create project of firebase

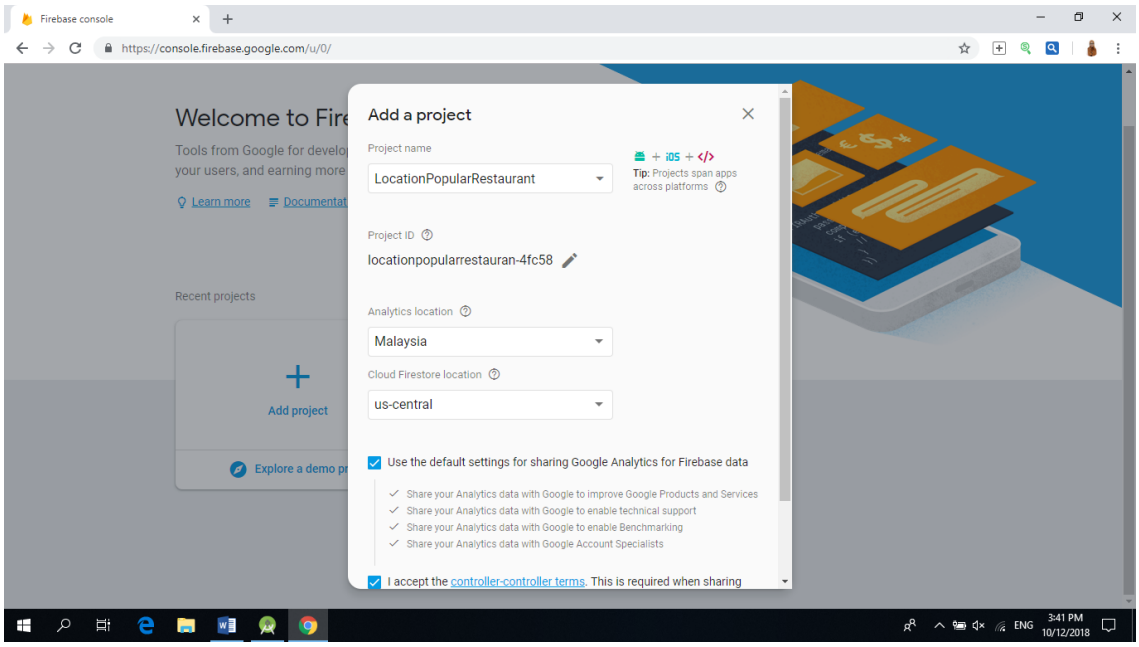


Figure 4.5: create project

Step 2: Register project (android studio) into project (firebase)

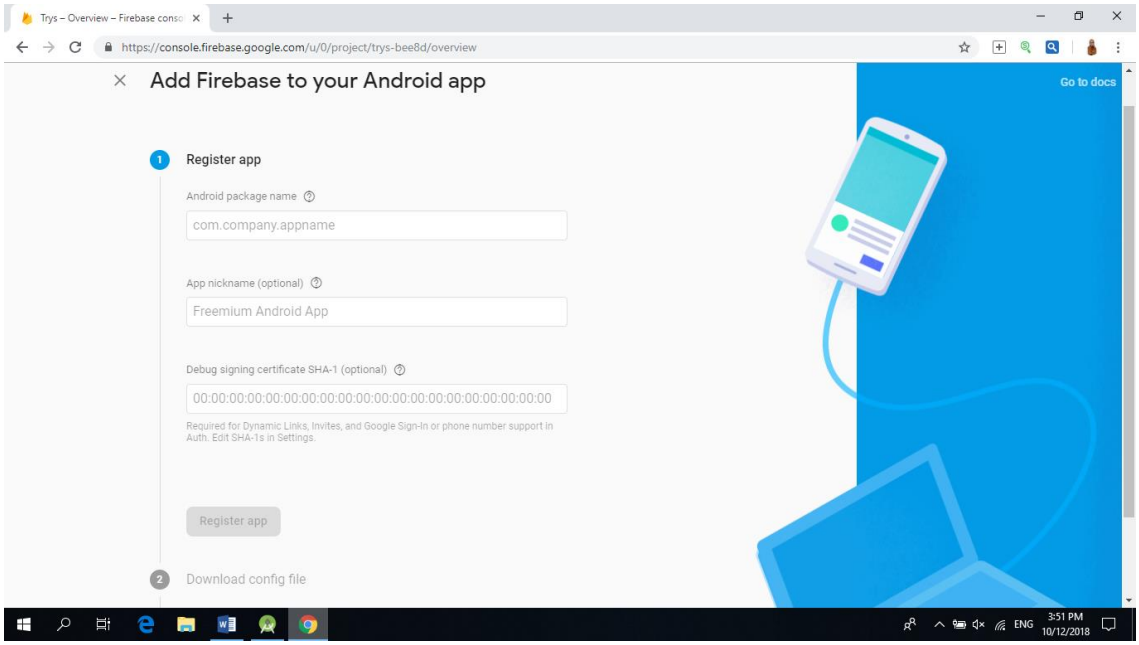


Figure 4.6: Register project android studio

Step 3: Download the json file

Step 4: Copy the json file to the app file into the project (android studio)

Step 5: Implement firebase into build.gradle script

Coding part of declare firebase in build.gradle scripts:

```
dependencies
{
        //Add library
        implementation 'com.google.firebase:firebase-core:16.0.1'
        implementation 'com.google.firebase:firebase-database:16.0.1'
}
apply plugin: 'com.google.gms.google-services'
```

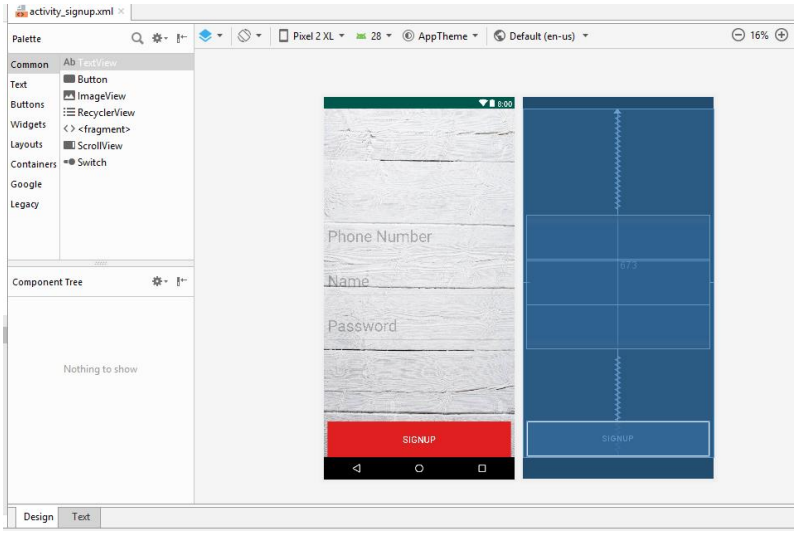


Figure 4.7: Signup interface

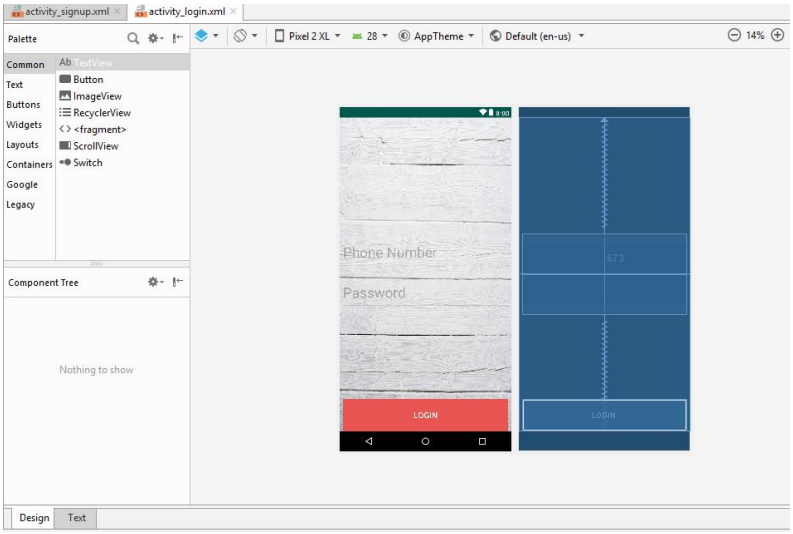


Figure 4.8: Login interface

Figure 4.7 and figure 4.8 shows the interface that using the database. The figure 4.7 is the signup interface that user need to input the data such as phone number, name and password. Then the data will save into firebase. To add the data into the firebase, the coding must declare first the firebase. Next, figure 4.8 is the login interface. In this scene, the data from the firebase will be read and compare to the user input. If the value same with existing data, it will go to the main menu page.

Coding part add data into firebase:

```
public class signup extends AppCompatActivity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_signup);
```

```
        // Firebase
        final FirebaseDatabase database = FirebaseDatabase.getInstance();
        final DatabaseReference table_user = database.getReference("user");

        table_user.addValueEventListener(new ValueEventListener() {

              @Override
              public void onDataChange(@NonNull DataSnapshot dataSnapshot)
              {

                    if(dataSnapshot.child(editPhone.getText().toString())
                       .exists())
                    {
                           Toast.makeText(signup.this,"Phone Number
                           already register!",Toast.LENGTH_SHORT).show();
                     } else {
                           User user = new User(editName.getText().toString()
                           ,editPassword.getText().toString());
                           table_user.child(editPhone.getText().toString())
                           .setValue(user);
                           Toast.makeText(signup.this,"Sign up successfully",
                           Toast.LENGTH_SHORT).show();
                           finish();
                     }
              }

              @Override
              public void onCancelled(@NonNull DatabaseError databaseError)
              {

              }
          });
```

Coding part read data from firebase:

```
public class login extends AppCompatActivity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_signup);

        // Firebase
        final FirebaseDatabase database = FirebaseDatabase.getInstance();
        final DatabaseReference table_user = database.getReference("user");

        table_user.addValueEventListener(new ValueEventListener() {

              @Override
              public void onDataChange(@NonNull DataSnapshot dataSnapshot)
              {

                    if (dataSnapshot.child(editPhone.getText().toString())
                        .exists())
                    {
                           User user= dataSnapshot.child(editPhone.getText()
                           .toString()).getValue(User.class);
                          if (user.getPassword().equals(editPassword
                              .getText().toString()))
                           {
                                  Intent intent = new Intent(Login.this,
                                  TypeRestaurant.class);
                                  startActivity(intent);
                                  finish();
                           }
```

```
                    else
                    {
                            Toast.makeText(Login.this,"Wrong password!",
                            Toast.LENGTH_SHORT).show();
                    }
                }
                else
                }
                    Toast.makeText(Login.this, "User not exist in
                    Database !", Toast.LENGTH_SHORT).show();

                }

            @Override
            public void onCancelled(@NonNull DatabaseError databaseError)
            {

            }
        });
```

Figure 4.9: Detail restaurant scene

Figure 4.9 shows detail restaurant interface of mobile application. For this scene, the application implement caller function for user to call the restaurant whether to booking the table or booking the food. That function must connect dialler phone with application. To use this function, application must ask the permission first to the phone for using that function. User can click button call at above in detail restaurant scene to call the restaurant. Other than that, this scene also implements the mapbox into the application. This mapbox used to show the location of the restaurant and show the navigation from user location to the restaurant location. To use this map, the application must put the coding access token in style.xml. This access token give permission to application using the mapbox function. User can click button direction at above in detail

restaurant scene to go the map scene. In addition, coding in build.gradle script also must do for implement the mapbox in the application.

Coding part of permission connect to call phone:

```
<uses-permission android:name="android.permission.CALL_PHONE" />
```

Coding part of go to dialler in phone:

```
Call.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        Intent intent = new Intent(Intent.ACTION_DIAL);
        intent.setData(Uri.parse("tel:095316583"));
        startActivity(intent);
    }
});
```

Coding part of access token for using mapbox in style.xml into values file:

```
<string
name="access_token">pk.eyJ1IjoiZGlraWVuYSIsImEiOiJjam5vN2pvOHowNW9h
M2tuNWxvbjFqbnkxIn0.lmam_cna_eg1JvYNNw2qrA</string>
```

Coding part of declare mapbox in build.gradle scripts:

```
dependencies {
    //Mapbox dependencies
    implementation 'com.mapbox.mapboxsdk:mapbox-android-sdk:6.0.1'
    implementation 'com.mapbox.mapboxsdk:mapbox-android-plugin-
locationlayer:0.5.0'
    implementation 'com.mapbox.mapboxsdk:mapbox-android-navigation:0.13.0'
    implementation 'com.mapbox.mapboxsdk:mapbox-android-navigation-ui:0.13.0'
}
```

Figure 4.10: Output of direction button from detail restaurant page

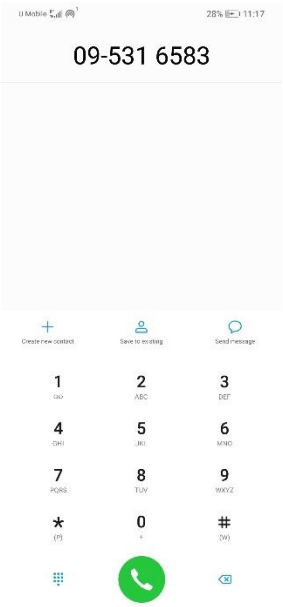


Figure 4.11: Output of call button from detail restaurant page

Figure 4.10 and figure 4.11 show the output of the button in the detail restaurant scene. At figure 4.10, user can click button start navigation to show the navigation from user location to the restaurant location. Beside from user knowing the way to the restaurant, user also will know the distance restaurant from the user location and also the time taken to go to the restaurant location. All information will display in map navigation scene. Other than that, at figure 4.11, user can directly click call button without dialler the number phone of the restaurant because the number phone is already display on the screen.

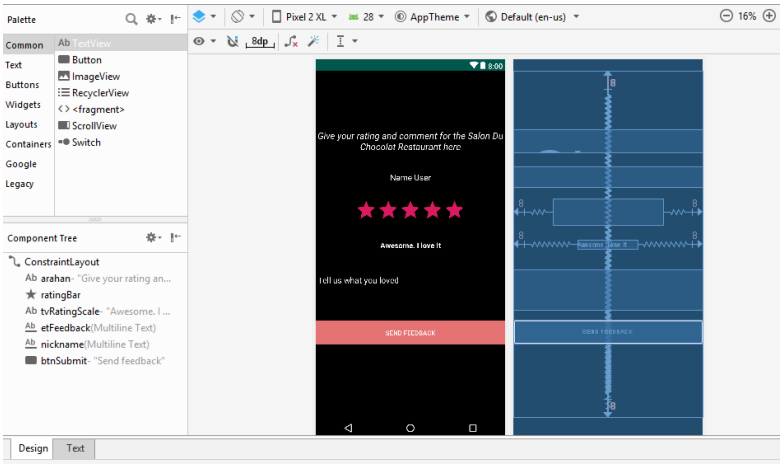


Figure 4.12: Rating scene

Figure 4.12 shows the rating interface for user to rate or comment the restaurant. This scene was implement the database for saved the name user, rating and comment to easy for other user make decision to go the restaurant. This mobile application is used firebase for the databased.

3.2.4 VERIFICATION

Verification phase are function for testing the coding to find out whether the code and programming are working based on the requirements. The bugs and mistake in implementation phase will be repaired at this stage. UAT testing will be used to make sure application meets the requirement.

3.2.5 MAINTENANCE

Lastly, in the maintenance phase, the system can be repaired when the bugs have exits after the verification phase. Besides, the maintenance phase is function to enhancement, correction, and changes according to the feedback from the end-user based on the evaluation of the application operates. This phases are very important to ensure the project is all under control and always free error for users.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 INTRODUCTION

This is the chapter that will testing the mobile application that have been created using android studio and discussion of the testing result. This phase also does the discussion in order to improve the application that can help travellers get more information about the popular restaurant in Kuantan, Pahang. In this discussion, advantages and disadvantages will be found according the result of the testing. More explanation about the code and result will be at this chapter.

4.2 VERIFICATION

In this verification phase, several tests will be run to discover any error that would be occur in the system. The test is also to find out the functionality of the system to the user. If there is problem occurred during the test, the developer can repair the bug or error in this stage. UAT testing will be used to make sure application meets the requirement. There are many aspects to testing which is unit testing, functional testing, integration testing and system testing. To do this UAT testing, there are several of student UMP who taken subject mobile application this semester will be choose. For the unit testing, normally the developer will do the unit test. However, for the functional testing, integration testing and system tasting it have chosen one student for each type of testing. Before do the UAT test, the questionnaire will be distributing to the user test to testing the app. The result has been analyse at the below

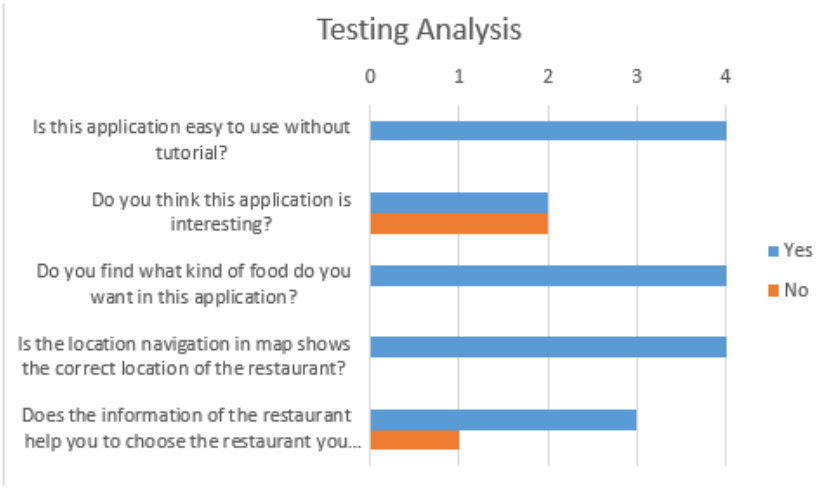


Figure 4.13: Questionnaire of testing

Figure 4.13 shows the questionnaire that have been distribute to the user testing. There are four students who have been chosen to make the testing to the application. For the Q1, the analysis show all the user testing feel easy to use this application. Maybe this application is not too complicated like game app because the scene is not too much. Next, Q2 have 2 people say “yes” and 2 people say “no”. Maybe for the user who say “no” feel not interesting because do not have sound or music like other application. This application just only has sound in the map. Move to the Q3, it shows all the user testing are say “yes”. This analysis shows the application have provided enough type of food. For the next question, it shows all the user testing say “yes”. This analysis is proving that the location navigation of this application is successful. Lastly, for the Q5, 3 of 1 people say “yes” and only one person says “no”. Might be for the user who say “no” feel the information does not enough to make a selection. For the next time, this application will add more information that will make more interesting to the user such as 3D AR model of the menu in each restaurant.

4.2.1 UNIT TESTING

The purpose of unit testing is to validate that each unit of the software performs as designed. A unit is the smallest testable part of any software. The advantage of unit testing is it can find problems early in the development cycle. The result is in the table below.

Table 4.1: Unit Testing

INTERFACE	UNIT TESTING	EXPECTATION	ACTUAL RESULT	PASS/FAILED
Home Page	Exit Button	Exit the app	Exit the app	PASS
	Start Button	Go to main page interface	Go to main page interface	PASS
Main Page	Back Button	Go to home page	Go to home page	PASS
	Home Button		Go to home page	PASS
	Type food button	Go to name restaurant interface for each type of food	Go to name restaurant interface for each type of food	PASS
Name Restaurant	Back Button	Go to type food interface	Go to type food interface	PASS
	Home Button	Go to home page	Go to home page	PASS
	Name restaurant button	Go to detail restaurant interface for each name of restaurant	Go to detail restaurant interface for each name of restaurant	PASS
	Back Button	Go to name restaurant interface	Go to name restaurant interface	PASS

Detail Restaurant	Home Button	Go to home page	Go to home page	PASS
	Next book menu Button	Display next image of book menu	Display next image of book menu	PASS
	Previous book menu Button	Display previous image of book menu	Display previous image of book menu	PASS
	Call Button	Go to dialler call	Go to dialler call	PASS
	Direction Button	Go to map interface	Go to map interface	PASS
	Comment Button	Go to rating restaurant interface	Go to rating restaurant interface	PASS
Map	Back Button	Go to detail restaurant interface	Go to detail restaurant interface	PASS
	Home Button	Go to home page	Go to home page	PASS
	Start Navigation Button	Go to navigation interface	Go to navigation interface	PASS
	Exit Button	Go to map interface	Go to map interface	PASS

Navigation	Sound Button	On/Off the sound	Can on/off the sound	PASS
	Report Button	Make report for traffic, road closed, bad route, other map issue, confusing instruction and not allow way	Can make report	PASS
Rating Restaurant	Back Button	Go to detail restaurant interface	Go to detail restaurant interface	PASS
	Home Button	Go to home page	Go to home page	PASS
	New review Button	Go to new rating interface	Go to new rating interface	PASS
New Rating	Back Button	Go to rating restaurant interface	Go to rating restaurant interface	PASS
	Home Button	Go to home page	Go to home page	PASS
	Submit Button	Go to rating restaurant interface and bring the data	Go to rating restaurant interface and bring the data	PASS

4.2.2 FUNCTIONAL TESTING

The functional of mobile application that will be testing is the point of interest(POI) and the navigation walk mode. For the POI testing, it will test the specific point location either the point of each location restaurant in the map correctly with the real latitude and longitude coordinate. Besides, it will also be testing the navigation walk mode either the movement of a user will detect or not when the navigation is working. The result is in the table below.

Table 4.2: Functional Testing

FUNCTIONAL TESTING	EXPECTATION	ACTUAL RESULT	PASS/FAILED
Point of Interest(POI) testing	The location of each restaurant in map is correctly with real location	Each restaurant in map is correctly with real coordinate latitude and longitude	PASS
Navigation Walk Mood	The user movement can detect in map when the navigation is still working	The user movement from one place to another place have detect although the navigation is still working	PASS

4.2.3 INTEGRATION TESTING

Integration testing is combination of the unit tested module one by one and test the behaviour as a combined unit. The goal or main function of this testing is to test the interface between the unit or modules. For integration testing, it will verify the new rating interface will link between the rating restaurant interface when a user click the button submit the rating. Other that, it will verify detail of restaurant interface will link between

map interface when user click button direction and link between rating restaurant when user click button comment. Next, it also verifies the type food interface will link correctly between name of restaurant interface when user click one of the button type of food. Lastly, it also verifies the name restaurant interface will link between correct detail restaurant interface when user click one of the button name of restaurant. The result is in the table below.

Table 4.3: Integration Testing

INTERFACE	EXPECTATION	ACTUAL RESULT	PASS/FAILED
Main page interface	When user click one of type food button in main page interface, it will link correctly between main page interface and name of restaurant interface	It go correctly to the name of restaurant interface from button of type food that user clicked	PASS
Name restaurant interface	When user click one of name restaurant button in name restaurant interface, it will link correctly between name restaurant interface and detail restaurant interface	It go correctly to the detail restaurant interface from button of name restaurant that user clicked	PASS
	When user click direction button, it	It go correctly to map location	PASS

Detail restaurant interface	will link correctly between detail restaurant interface and map interface	interface when user click direction button for each name restaurant	
	When user click comment button, it will link correctly between detail restaurant interface and rating restaurant interface	It go correctly to rating restaurant interface when user click comment button for each name restaurant	PASS
New rating interface	When user click button submit, it will link correctly between new rating interface and rating restaurant interface	It go correctly to rating restaurant interface when user click submit button for each name restaurant	PASS

4.2.4 SYSTEM TESTING

System testing in order to measure the quality of the system unbiased. It includes both functional and non-functional testing. Normally this testing will done by professional testing before it introduces to the market. The result is in the table below

Table 4.4: System Testing

TYPE SYSTEM TESTING	EXPECTATION	ACTUAL RESULT	PASS/FAILED
		User ease to use because no words	PASS

Usability Testing	User ease to use the application and flexibility in handling controls	that have never seen and the mobile app use the common symbol button	
		Flexibility in control the map	PASS

CHAPTER 5

CONCLUSION

5.1 INTRODUCTION

This chapter will describe the summarization of all the four chapter in this thesis, the future enhancement, the limitation of the app and project constrains. Moreover, this chapter will explain on how this project can be improve and expand more based on in features and technologies and discuss the advantages of this mobile application.

5.2 CONCLUSION

For conclusion, this Location Popular Restaurant is the mobile application that provide the detail of the popular restaurant in Kuantan, Pahang. This mobile app can help to find the best restaurant in Kuantan especially for those who are travelling in Kuantan and student who studying in Kuantan that are not familiar with the place in Kuantan. Location Popular Restaurant in Kuantan was created using android studio by using Java language. This mobile app functional to give information and direction easily to the user to go to the popular restaurant in Kuantan, Pahang. This mobile app contains six type of cuisine which is western, steamboat, malay, arab or mamak, café and dessert. From the result that we got from Chapter 4 it seems that, this mobile app is effective for user after use this app because it helps user give more information for each restaurant and give location navigation too easy for user know the direction from the user place to the restaurant place.

Furthermore, this mobile app has fulfilled the objective according to the result from the last chapter (Chapter 4: Implementation, Testing and Result Discussion). From the result, its show that this mobile app effectiveness toward for tourism and student to choose the restaurant based on rating each restaurant that given from the other user.

5.3 FUTURE ENHANCEMENT

This project will be improving by some years which is contains more future such as offline map. This future can make user ease to use the mobile application because user will not to depends with internet connection to use the map navigation. Other than that, this mobile application will add the nearby place for the restaurant. It makes user know about the nearby restaurant especially for those who not have transport. It eases for user to go the restaurant that nearby to their location. Lastly, this mobile app will add the 3D AR model of popular menu and 360 panorama view in the map for each restaurant to make user more interesting to use this application. Hope this application can give more information to the user especially to tourist who travel in Kuantan and student who study in Kuantan, Pahang.

5.4 LIMITATION OF THE PROJECT

The limitation of this mobile application is not all restaurant in Kuantan have in this app. Only the popular restaurant and have a good rating from the user that will be display in this mobile app. Other than that, user who want to use the navigation function of this mobile app, it must have internet connection to detect the navigation from user location to the restaurant location. Besides, the limitation of this mobile app is only can used with android platform. User who used IOS cannot used this application. Lastly, this application only has sound in map to give direction. Not have many multimedia elements because it not appropriate to put more audio or video player in this application.

5.5 PROJECT CONSTRAINS

Project constraints that was happen between the development phases in the coding part. Especially for the database coding, it has more sensitive to the spelling to the target class that was used for connection with another part of coding. In addition, it also has to be carefully when declare something to get the value from the database because if it has only one wrong, it will affect all the coding that used the database.

5.6 ADVANTAGES OF THIS MOBILE APP

The advantages of this mobile application is have more information of the restaurant and have up-to-date information. Other than that, this mobile application make user easy to go to the restaurant by using the navigation location that other existing system are not having it. This navigation will give detail direction from user location to the restaurant location. Next, all review restaurant from the user in this application can make help other user find the best restaurant in Kuantan and the owner of the restaurant can improve the restaurant by read the user comment.

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APPENDIX A

Survey for PSM

I would like to develop the mobile application of Location Popular Restaurant in Kuantan, Pahang. Therefore, this survey are function to analysis how much information do you know about Kuantan restaurant. The answer that you provide will make improvement to my mobile application.

Did you know popular restaurant in Kuantan?

- ○ Yes
- ○ No

How did you find way to go specific location?

- ○ Google Map / Waze
- ○ Sign Board
- ○ Asking People

Did you often use google map or waze to find the location?

- ○ Yes
- ○ No

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APPENDIX B

Result for Testing

Is this application easy to use without tutorial?

- ◯ Yes
- ◯ No

Do you think this application is interesting?

- ◯ Yes
- ◯ No

Do you find what kind of food do you want in this application?

- ◯ Yes
- ◯ No

If no for the answer question 3.Can you write what kind of food do you want to put in this application?

Your answer

Is the map shows the correct location of the restaurant?

- ◯ Yes
- ◯ No

Does the information of the restaurant help you to choose the restaurant you want to go?

- ◯ Yes
- ◯ No

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