

Development of Backpacker Guide Application for Android Based Smartphone

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Abstract: Backpacker is someone who take a vacation or travelling with a backpack. Backpacking is a form of low-budget and independent way of travelling. However, most of backpacker applications which found in Google Play Store are lacking some important features and functions such as lack of routing, bookmark and search functions. Therefore, users are required to install more than one backpacker applications to get enough information and this will occupy the storage and memory of their mobile device. Thus, a Backpacker Guide Application is developed by integrating the features and functions from different applications to meet the backpackers' requirements. To develop a Backpacker Guide Application in Android mobile platform by using Android Studio and test it by alpha and beta testing to the target user are the objectives of this project. Agile model is chosen as project methodology. The focus of Backpacker Guide Application is to provide tourist spot information and route the user from current location to the destination by using the Google map. The information of the tourist spots will be displayed with description, photos and contact details to the user. Based on the beta testing conducted, the acceptance level achieved is 93%, which there is a high percentage of acceptance from the target users.

Keywords: Backpacker, Tourist Spot, Route, Tourist Spot Information, Location

1. Introduction

Traveling is a way to gain knowledges and experiences by broaden one's horizons and able to relax at the same time. Many people will have a trip when they want to get some rest or to get away from their problem in life. This is because, some people believe that a trip or travel may provide a solution or a direction to guide them what to do next in their life [1]. Therefore, there are many backpackers nowadays as sometimes we can see they are walking along the street or roadside with their backpack [2]. However, there are only few backpacker applications existed in the Malaysia market and most of the backpacker applications proposed are lacking some features and functions. Therefore, the user needs to install multiple applications into their mobile device to get enough information. As a result, a huge storage and memory will be occupied in users' mobile device. Thus, a Backpacker Guide Application is developed so that it can be as a tool which is very convenient for those backpackers and with the application everyone can be a backpacker.

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The main purpose of the application is to gather the information about travelling into one platform to provide specific information for the user. Besides, this application will combine features and functions from existing backpacker applications to provide an integrated and informative application for the users. Therefore, the objectives of the project are to develop a Backpacker Guide Application in Android mobile platform by using Android Studio and test it by alpha and beta testing to the target user are the objectives of this project. Furthermore, in the project scope, the target user for the Backpacker Guide Application is identified to travel lover who above age 21 and consist of 6 modules. The 6 modules are Authentication, Display Tourist Spot, Description, Add tourist Spot, Search and Bookmark modules. The following section will discuss about the Related work. The Methodology of the project will be discussed in section 3 and the section 4 will discuss the Results and Discussion of the project. Lastly, a conclusion will be explained to conclude the project in section 5.

2. Related Work

A study on related work which has been accomplished will be discussed in this section. It will cover a background study on backpacker guide application, and mobile device applications. A comparison between existing similar applications and the developed application will be also explained.

2.1 Backpacker Guide Application background

Backpacker is someone who take a vacation or travelling with a backpack. Backpacking is another different way of low-budget and independent travelling. Backpackers normally travel for long period to many difference places to experience different way of life and expose to different culture. Therefore, they will stay at cheap motels or homestay and cook their own meals just like the locals. Local transport or walking will be their choice and hang out with locals. Luxury and comfort are not the main concern to them. In short, to explore and experiencing new things from different places with small budget is their main focus. They prefer seeing the ‘real’ attractions of the country and learning the local culture instead of having a trip which offered by tourists. In the past, people are hard to be a backpacker due to the communication problem and the lack of transportations as the technologies and Internet are yet to be develop at that time [3]. Backpacker only have a backpack with map or book to guide them during the trip. They may get lost because the tourist spots or places which they visit may be different from the map or books. After the technologies and internet become more and more advance, the location tracking applications by using GPS are very useful for the backpacker as they will be guided by the application with real-time map and will not get lost easily. Lately, those applications are developed with more advance function such as suggesting the tourist spots/places, where they can get the transports, places to eat and rest or even the services of booking a flight, Grab car and hotels. These can help backpackers to travel more safely and easily. Therefore, a Backpacker Guide Application is proposed mainly to focus on tracking user’s location and provides the nearby tourist spots/places which can be reached in walking distance. The tourist spots/places recommended will focus more on authentic and locals to the user.

2.2 Mobile Device and Mobile Application

The occurrence of Internet causes the rapid growth of smart phone development as there are more and more people using smart phone nowadays, regardless of their age. According to the Statista [4], there were 28.4 million people prefer to use mobile device to access Internet. The number of Malaysian mobile Internet users is estimated and will increase to approximately 33.43 million people in 2025 [4]. According to the app download and usage statistic, the amount of mobile application download has increased from 20.9 billion in 2019 to 28.7 billion in 2020 [5]. Therefore, not only the number of mobile Internet users will increase, the amount of mobile applications installed will also grow exponentially. This is because, many people found that using mobile phone is more convenient than other devices as they can access the mobile phone anytime, anywhere and it is easy to bring along [6].

2.3 Comparison of Existing Application

A comparison among the existing backpacker applications and proposed application is made in this section. The existing applications are Backpacker's Ipoh Tourist Map [7], Backpacker's Kuala Lumpur Tourist Map [8], Malaysia Guide by Triposo application [9] where the proposed application is Backpacker Guide Application. The comparison made is according to the system requirement, features, strengths, and weakness. The comparison is tabulated in Table 1.

Table 1: Comparison between existing applications with the developed application

Element	Backpacker's Ipoh Tourist Map	Backpacker's Kuala Lumpur Tourist Map	Malaysia Guide by Triposo	Backpacker Guide Application (Proposed Application)
Platform	Android	Android	Android /IOS	Android
Online/Offline Mode	Online	Online	Online	Online/Offline
Route	Available	Available	Not Available	Available
Fee	Free to install	Free to install	Free to install	Free to install
Module	-Routing Module	-Routing Module	-Search Module -Categorize Module	-Search Module -Categorize Module
	-Categorize Module	-Categorize Module	-Bookmark Module -Currency Convert Module	-Bookmark Module -Add New Tourist Spot Module
Strengths	-Free to use -Route the user by map - Easy to use -Categorical	-Free to use -Route the user by map - Easy to use -Categorical	-Informative -Provide currency exchange tool -Provide travel experiences -Provide search features -Categorical -Provide bookmark feature	-Free to use - Easy to use -Attractive and simple interface -Informative -Route the user by map -Provide search features -Categorical -Provide add new tourist spot function -Provide bookmark feature
Weakness	-Cannot support offline -No search function -No bookmark function -Less attractive of user interface	-Cannot support offline -No search function -No bookmark function -Less attractive of user interface	-Too wordy -Many buttons -No routing function	-Cannot totally support offline

Table 1 shows the Comparison between existing applications with the proposed application. The existing application, Malaysia Guide by Triposo can support both IOS and Android Platform while for the others only can support Android platform. All existing application can only be access in online mode but for the proposed application, Backpacker Guide Application can support both online and offline mode. Besides, all the existing and proposed application are free to install. The strength of both existing application, Backpacker's Ipoh Tourist Map and Backpacker's Kuala Lumpur Tourist Map provided the Routing function for the user so the user can route to the destination by map. They are

categorical but the weaknesses of these applications are not able to access in offline mode, no search and bookmark functions provided and less attractive of user interface. On the other hand, the strength of existing application, Malaysia Guide by Triposo provided currency exchange tool and informative but it is too wordy and many buttons. It also does not provide the routing function. The strengths of proposed application, Backpacker Guide Application are easy to use and consist of more functions and features because it has combined the functions from existing applications but it cannot not totally support offline mode.

3. Methodology

In this section, the methodology is discussed. The methodology chosen to develop this project is Agile model [10]. This model is a type of project management process mainly used for software development and it consists of 6 phases which are Requirements, Design, Development, Testing, Deployment and Review. The 6 phases will be discussed in the next sub-sections 3.1.

3.1 Requirements

After the idea and title of the project, Backpacker Guide Application has been approved by Supervisor, the purpose of developing this mobile application is clarified which is to solve the problem of existing Backpacker Application and enhance the features to bring more useful services for the users. Next, the objectives of the project have been identified in the phase which is to develop a Backpacker Guide Application in Android mobile platform by using Android Studio and test it by alpha and beta testing to the target user are the objectives of this project. After that, a Gantt chart has been created to manage this project and a research on features and functions of the existing application is carried out so that the scope of the proposed application can be identified. The scope of the proposed application is determined to have 6 modules which are Authentication, Search, Display Tourist Spot, Display Tourist Description, Add Tourist Spot and Bookmark modules. Then, the requirements such as software, hardware, functional and non-requirements are identified according to the scope of project and the expected result of the application is conceived.

3.2 Design

In Design phase, the storyboard of the application is drafted according to the scope and expected result which have determined in Requirement phase. After that, the structure diagrams of the Backpacker Guide Application are designed in this phase such as Flowchart diagram, Entity Relationship diagram (ERD), Data Flow diagram (DFD), Content Design diagram and System Navigation diagram by using Draw.io. The System Navigation and Content Diagram are shown in Appendix A.

3.2.1 Context Diagram

Figure 1 shows the context diagram of the Backpacker Guide Application. The input data from the user to the Backpacker Guide Application are Sign-in or Sign-up information, User Current Location Coordinates, Bookmark Status, New Added Tourist Spots Information, Tourist Spot Name and Type of Category whereas the output data from the Backpacker Guide Application to the user are the Tourist Spot List, Tourist Spot Description, Bookmark Records, Searched Output and Categorized Tourist Spot List.

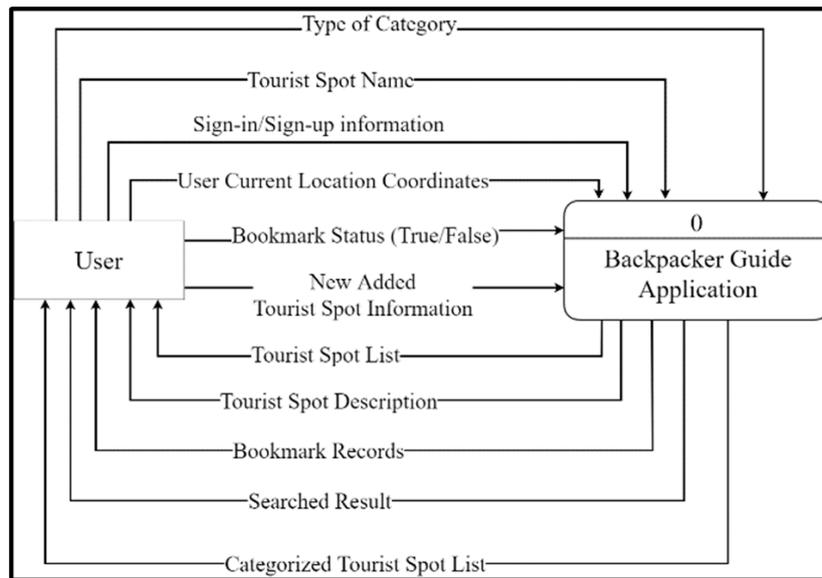


Figure 1: Context diagram

3.2.1 Data Flow Diagram

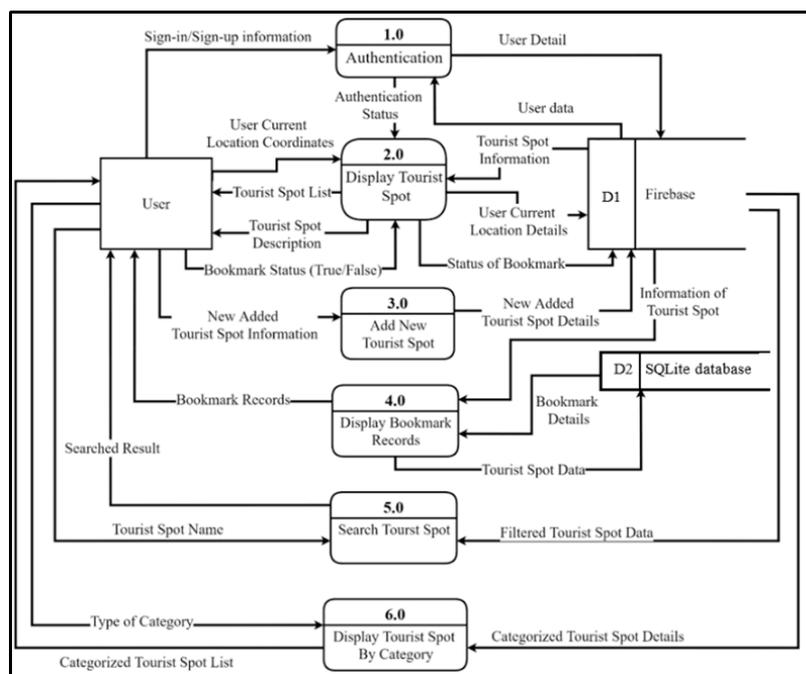


Figure 2: Data flow diagram

Figure 2 shows the Data Flow Diagram (DFD) of Backpacker Guide Application. There are six processes involved in this application. User needs to sign-in before entering to the Homepage of the application. Therefore, the user Sign-In or Sign-Up information should be input to the application. The User Details acquired from the user will be stored into a Firebase database. After the Sign-In Process has completed and user is brought to the Homepage of the application which will Display the Tourist Spot List to the user and at the same time the application is tracking the user's current location coordinates and saved to the application. The User Current Location Coordinates will be stored into the Firebase and the Tourist Spot Description will need to be retrieved for the user. There is also an Add Tourist Spot process which allows user to add new tourist spot to the application, so the input data of New Added Tourist Spot Information is needed from user. The New Added Tourist Spot Information

provided by user will then be stored into the Firebase. Furthermore, the process of Display Bookmark Records will need to retrieve the records from SQLite database and output displayed for the user. In the Search Tourist Spot process, the user needs to input the name of tourist spot and the filtered tourist spot data will be retrieved from the Firebase and the result will be shown to the user. Lastly, in the Display Tourist Spot by Category process, the user is required to input the type of category, then the categorized tourist spot list will be shown for the user.

3.2.2 Entity Relation Diagram (ERD)

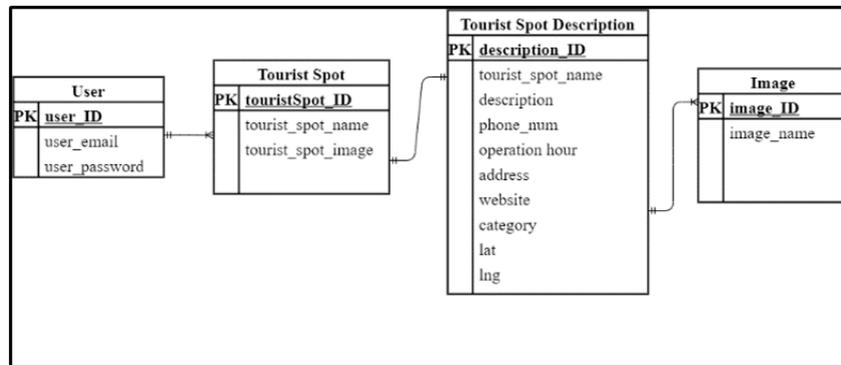


Figure 3: Entity relationship diagram

For this application, there are four identified entities. Based on Figure 3, User entity is used to store user information such as user_ID which is a Primary Key, user_email and user_password. The user data is required in the Sign-In process. Next, the Tourist Spots entity included touristSpot_ID which is a primary key where the tourist_spot_name is the Foreign Key. There is also a tourist_spot_image in this entity. These data are needed for the process of displaying tourist spots to the user. The Tourist Spots Description entity included description_ID (Primary Key), tourist_spot_name (Foreign Key), description, operating_hour, phone_num, address, website, category, lat and lng. Furthermore, the image_ID (Primary Key) and image_name are stored in Image entity. The relation between User entity and Tourist Spots entity is one to many. A user can either view one or many tourist spots information from the application. Next, the relation between Tourist Spot entity and Tourist Spot Description entity is one to one. A tourist spot will only have one description. At the same time, in a tourist spot description will have many images. Therefore, the relation between the Tourist Spot Description and Image entity is one to many.

3.2.3 Flowchart

Figure 4 shows the flowchart diagram of this application. First user required to have an account for the application, if not, user need to Sign-Up by entering the user's email and password to create an account. If the user sign-up process is successful, then the user can sign-in into the application. Inversely, if the user fails to sign-up, user needs to reenter the sign-up information. If the user already has an account, user can directly sign-in to the application by inputting user's email address and password.

After user sign-in successful, user will be navigated to the Homepage of the application which will display the list of tourist spots to the user. If user selects a tourist spot in the list the application will navigate user to the Description page, and it will display tourist spot descriptions together with its related images and contact details. User is also allowed to add bookmark on the selected page of a tourist spot. User can stay on current page or quit the application. If user decided to quit from current page, user can click on the back button and will go back to the Homepage of the application.

Next, user is allowed to search the tourist spot by inputting the tourist spot name in the search box. If the input tourist spot is found, it will display the result to the user, if not, user needs to reenter the

tourist spot name. User can also display the tourist spot list by categories such as Food, Nature, Hills, Beach and Homestay.

Besides, user is allowed to view the Bookmark records in the bookmark page. User is navigated to the bookmarked tourist spot description page if user clicks on the bookmarked tourist spot. Furthermore, bookmarked tourist spot can be deleted by user. Lastly, user can logout from the application if user wants to exit from the application.

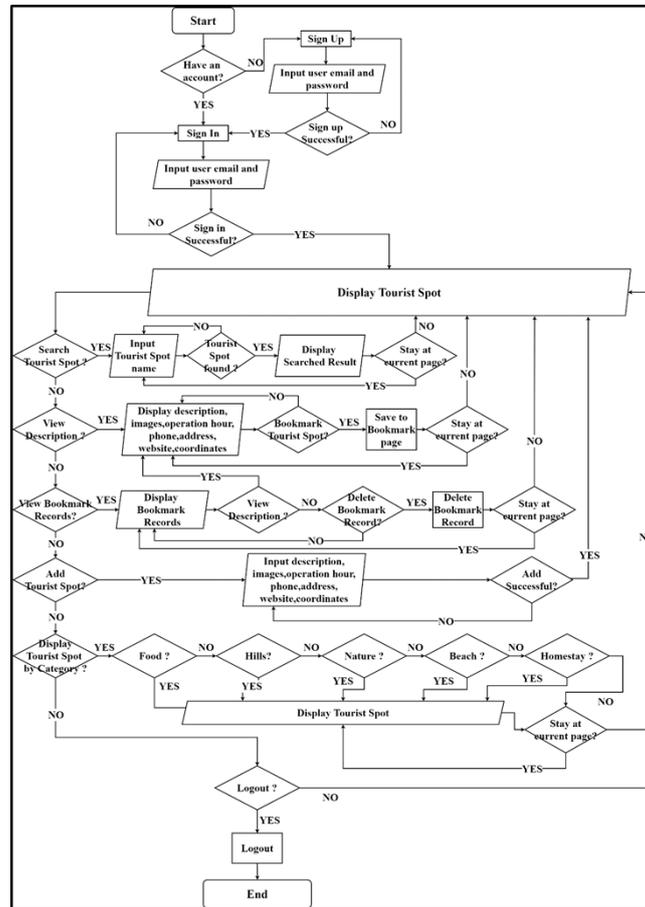


Figure 4: Flowchart diagram

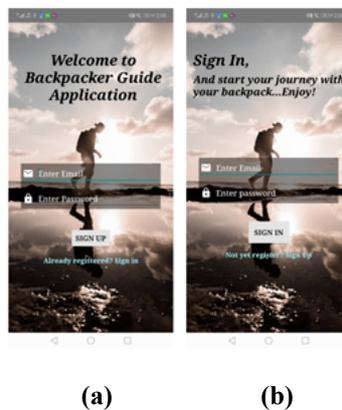


Figure 5: Interfaces for (a) Sign up interface (b) Sign in interface

3.3 Development

After the design stage, the project comes to implementation phase and the application will be develop by using Android Studio with Java language and XML. The frontend of the application is developed by using XML where the backend used the Java language to develop

3.3.1 Development of Authentication Module

This module consists of two functions which are Sign-In and Sign-Up. Figure 5 (a) and (b) shows Sign Up and Sign-In interface. Sign-In function is to allow the user to sign-in to the application while the Sign-Up function is to allow the first-time user to register an account for the application.

3.3.2 Development of Display Tourist Spot Module

This module consists of three functions which are Display Tourist Spots List by Recycler View, Categories Selection Bar and Bottom Navigation Bar.

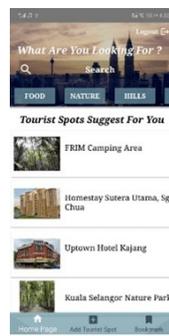


Figure 6: Home page interface

Based on Figure 6, the RecyclerView in the middle of Homepage is a container that can hold data in a recycler mode and it has been used to hold the tourist spot lists and then display it to the user. Besides, the Categories selection is created to organized the suggestion of tourist spots list according to the category so that the user could find the target tourist spot by categories such as Food, Nature, Hills, Beach and Homestay. Next, the Bottom Navigation Bar in the Homepage which allows user to switch between the interfaces of Home, Add Tourist Spot and Bookmark.

3.3.3 Development of Description Module

This module consists of two functions which are Displaying Tourist Spot and Routing with Google map.

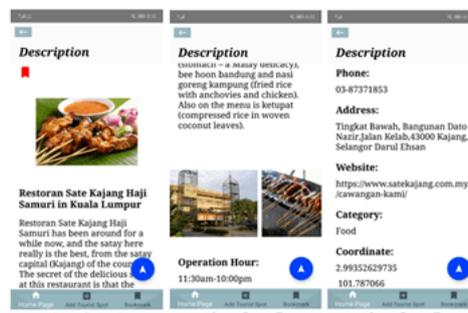


Figure 7: Description interface

Figure 7 shows the Description interface and the detailed information of the tourist spot including, description, images, operation hour, phone number, address, website, category and location. The location can be route by Google map by clicking on the floating button.

3.3.4 Search Module

This module allows the user to search tourist spot by using the search box.

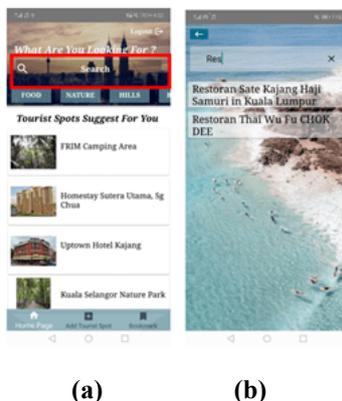


Figure 8: Interfaces for (a) Search Box in Homepage (b) Search

Figure 8 show the Search Box in Homepage and the Search interface. When the user clicks on the search box on the top of the Homepage, it will navigate the user to the Search interface. The user can insert the tourist spot name and the relevent results will be listed out.

3.3.5 Add Tourist Spot Module

In this module the user is allowed to add a new tourist spot by adding the information and images

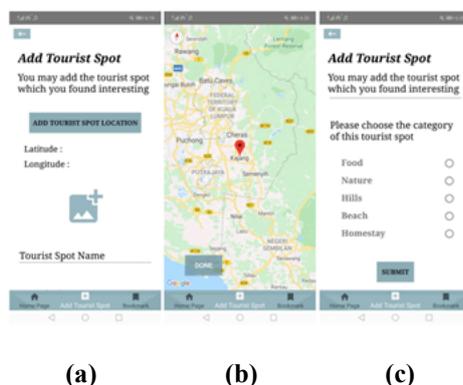


Figure 9: Interfaces for (a) Add Tourist Spot (b) Add Marker (c) Add Tourist Spot

Based on Figure 9, user is required to input a new tourist spot information to the application which includes the tourist spot name, cover image, three related images, operation hour, phone number, address, website. Besides, the user can add the tourist spot location by adding a marker on the Google Map then the coordinates of the location will be loaded automatically and stored as data. On the other hand, the user will require to choose the category for the new added tourist spot. After the user completed filling up the information, user clicks on the submit button and the new added tourist spot will be seen in the Homepage recycler view list.

3.3.6 Bookmark Module

This module allows the user to save the tourist spot information which found interested in the Tourist Spot Description Interface and the information from that page will be stored into Bookmark interface as a record. All records of the bookmark will be stored into SQLite database. Therefore, this module can support offline



Figure 10: Bookmark Interface

Figure 10 shows the Bookmark interface. User can view through the bookmark records by scrolling through the interface. Besides, the user can click on one of the list and it will navigate the user to the Bookmark Description interface which will display more detailed information. If the user want to remove a the boomark record, user can click on the delete button and a Delete Confirmation Message will prompt out to make comfirmation.

3.4 Testing

After the six modules have been developed, the alpha testing is conducted in this phase to ensure that all the functionalities are working well without error before the application is distributed to the target user. Each of functions and buttons of the module are tested. The errors and bugs which discover during this testing phase are corrected.

3.4.1 Alpha Testing

Alpha testing is carried out in the testing phase of the project. All the functions and buttons are tested to ensure that they are working well before the application release. The alpha testing result is shown in Table 6.

Table 6: Results of alpha testing

Modules	Test	Expected Result	Actual Result	Corrective Action
Sign-Up & Sign-In	Sign-Up Link	Navigate to Sign-Up page	Function well.	No need
	Sign-Up Button	Register an account	Function well.	No need
	Sign-In Link	Navigate to Sign-In page	Function well.	No need
	Sign-In Button		Function well.	No need
Display Tourist Spot	ImageView in Recycler View List	Navigate to the Tourist Spot Description page	Function well.	No need.
	Food Category Button	Navigate to Food page	Function well.	No need.
	Nature Category Button	Navigate to Nature page	Function well.	No need.
	Hills Category Button	Navigate to Hills page	Function well.	No need.
	Beach Category Button	Navigate to Beach page	Function well.	No need.
	Homestay Category Button	Navigate to Homestay page	Function well.	No need.

Table 6: (continued)

Modules	Test	Expected Result	Actual Result	Corrective Action
Search	Search Button	Navigate to Search page	Function well.	No need
	Back Button	Navigate to the Homepage	Function well.	No need
Display Tourist Spot Description	Back Button	Navigate to Homepage	Function well.	No need
	Bookmark Button	Save the information to Bookmark page	Function well.	No need
Add Tourist Spot	Back Button	Navigate to Homepage	Crash	Use <code>setOnClickListener()</code> and <code>startActivity(intent)</code>
	Add Tourist Location Button	Navigate to Marker Fragment	Other information filled will be clear if not adding the location first.	Should add for the tourist spot location first then proceed filling up other information.
Bookmark	Back Button	Navigate to Homepage	Crash	Use <code>setOnClickListener()</code> and <code>startActivity(intent)</code>
	Delete Button	A Confirmation Delete Message Prompt	Delete directly without confirmation	Use <code>dialog builder()</code> function
Logout	Logout Button	A Confirmation Logout Message Prompt then navigate to Sign-In page	Quit directly from Application	Use <code>dialog builder()</code> function

Based on the Table 6, the alpha testing is carried out by testing though all the modules and functions to ensure that they are working well without error and meets the functional requirements which stated in requirements phase. The actual result tested from most of the modules are functioning well and correction action is not needed except for the Add Tourist Spot, Bookmark modules and Logout functions. Their actual results consist of errors and the correction actions are carried out to solve the errors.

3.5 Deployment

In this Deployment phase, the APK of Backpacker Guide Application is built and the process of generating the APK file will be shown in Figure 11.

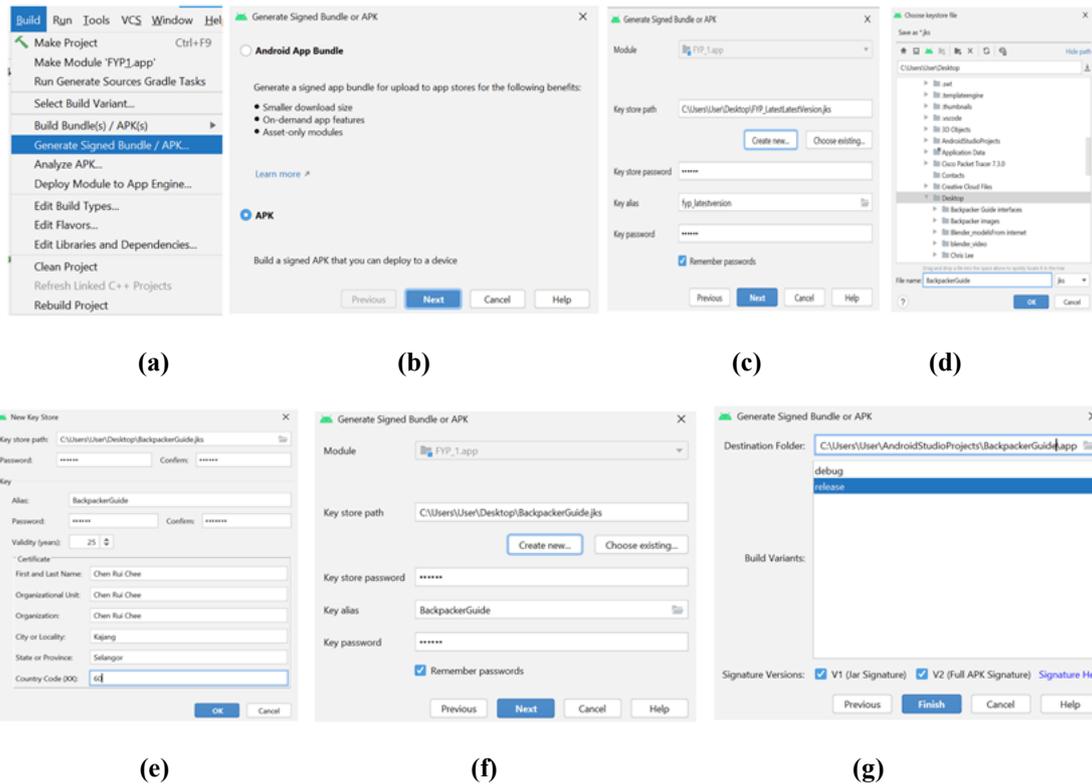


Figure 11: Process of generating APK (a) Step 1 (b) Step 2, process of choosing key store file (c) Step 1, (d) Step 2, (e) Step 3, and (f),(g) Release of APK file

Based on Figure 11, the steps of generating the Backpacker Guide APK is Build > Generate Signed Bundle/APK. After that, select the APK in the Generate Signed Bundle/APK window and press Next Button. After user pressed the Next Button in Figure 11 (b) and will be navigated to this page in Figure 11 (c) and click on the Create button. After that, choose the location for the Key Store File saving. Next, the developer needs to fill up the relevant information such as Name, Password, Organization Unit and so on. Lastly, the Jar Signature and the Full APK Signature at the bottom of the window should be selected and click on Finish button and the APK is ready to release.

3.6 Review

In this Review phase, the Backpacker Guide Application APK is distributed to carry out the beta testing and at the same time collect the feedbacks and reviews from the target users. A set of questionnaires which including the functionals and user acceptance testing for the Backpacker Guide Application is prepared and carried out through Google Form. Then, the distributed questionnaire is collected from the target users and the data is analysed according to the feedbacks from the target users. With this, the project can be evaluated and verify whether the objectives have been achieved. The result will be explained in the next section.

4. Results and Discussion

This section will analyze and discuss the results for the beta testing of the Backpacker Guide Application which conducted in the testing phase and review phase respectively.

After the project development has accomplished, the beta testing will be carried out by involving 10 target users. A set of questionnaires is created through Google Form and distributed to the target user. The feedbacks are collected and analyzed.

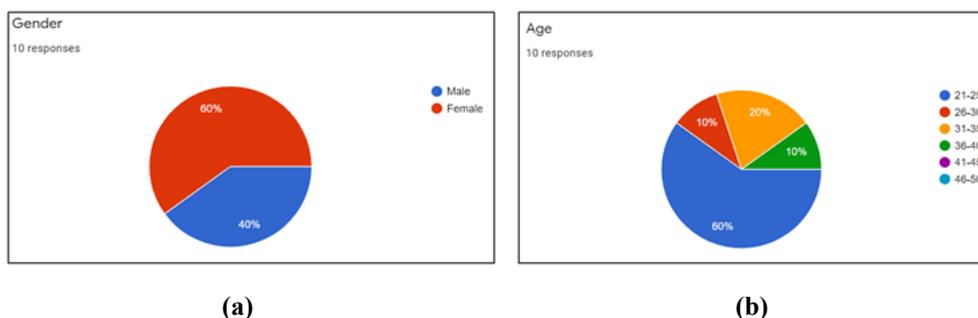


Figure 12: Respondent according to (a) Gender (b) Age

Based on Figure 12 (a), 6 out of 10 respondents are Female and the rest are Male. Based on Figure 12 (b), there is 10% respondent with age range from 26 to 30 and 36 to 40, while there is 2 respondents in age range of 31 to 35, 6 respondents in the age range of 21 to 25, and no respondent is in the age range of 41 to 45 and 46 to 50. All respondents have completed the user acceptance testing. The questionnaire consists of 2 sections which are user acceptance test and functionality test. Figure 8 shows the result of user acceptance test.

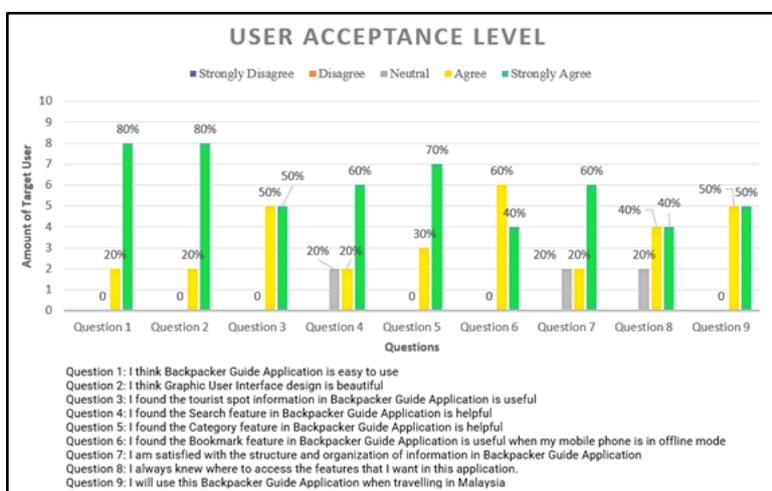


Figure 13: User Acceptance test result

According to Figure 13, there are 9 questions in the analysis of user acceptance level. In the first question, 80% of respondents strongly agree that the Backpacker Application is easy to use while 20% respondents agree that the application is easy to use. In the second question, 80% respondents strongly agree while 20% respondents agree that the graphic user interface design in Backpacker Application is beautiful. In third question, half (50%) of the respondents strongly agree and half of the respondents (50%) agree that tourist spot information provided by Backpacker Guide Application is useful. On the other, in question 4, 60% respondents strongly agree, 20% respondents agree that the Search feature is helpful and 20% respondents keep neutral for their answer. In question 5, there are 7 respondents strongly agree and 3 respondents agree that the Category feature is helpful for them. In question 6, there are 4 respondents strongly agree and 6 respondents agree that the Bookmark feature is useful when their mobile device is in offline mode. Next, in question 7, there are 80% respondents satisfied with the Structure and Organization of the information in Backpacker Guide Application while 20% respondents keep respondents keep neutral for their answer. In question 8, there are 4 respondents strongly agree and 4 respondents agree that they can always know where they can access the features of Backpacker Guide Application where 2 respondents (20%) keep neutral for their answer. The last question in the User Acceptance Section, there are 5 respondents (50%) strongly agree and 5 respondents (50%) agree that they will use the Backpacker Guide Application when they are travelling in Malaysia. There is no negative feedback given by the respondent in this section except for some neutral answers given.

Therefore, the user acceptance level is considered as in moderation and the features in this application can be improved to get better.

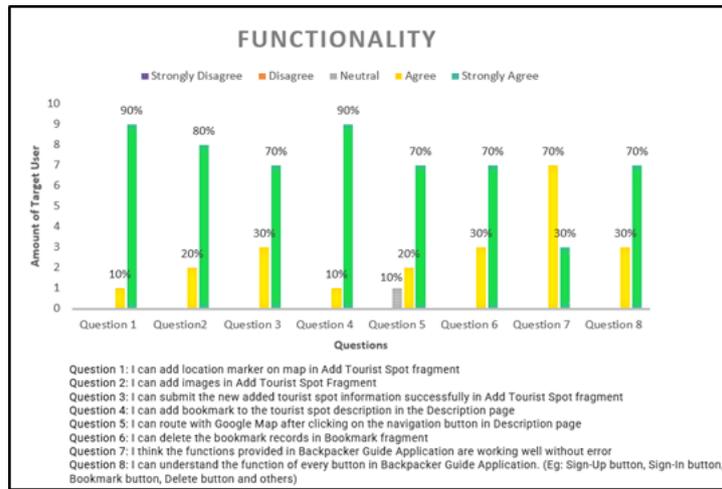


Figure 14: Functionality test result

Based on Figure 14, functionality testing consists of eight questions. In question 1, there are 90% respondents strongly agree and 10% respondent agree that they can add marker on the map in Add Tourist Spot Fragment of Backpacker Application. In question 2, there are 80% respondents strongly agree and 20% respondents agree that they can add images in Add Tourist Spot Fragment of Backpacker Application. In question 3, there are 7 respondents strongly agree and 3 respondents agree that they can submit add tourist spot information successfully in Add Tourist Spot Fragment of Backpacker Guide Application. In question 4, there are 90% respondents strongly agree and 10% agree that they can add bookmark in Description page. Next, in question 5, there are 70% respondents strongly agree, 20% respondents agree that they can find route with Google Map in Description page where 10% respondent keep his/her answer as neutral. In question 6, there are respondents 70% strongly agree and 30% respondents agree that they can delete the bookmark records in Application. While, in question 7, there are 70% respondents strongly agree and 30% respondents agree that the functions provided by the Application are working well without error. In the last question, there are 70% respondents strongly agree and 30% respondents agree that they understand the function of every buttons in Backpacker Guide Application. Besides, there is no negative feedback given by the respondent in this section. Therefore, it can be concluded that the functionalities and performance of Backpacker Guide Application are working well as planned.

Respondent	Questions																	Score
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	
R1	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	85
R2	5	5	4	5	5	5	5	4	5	5	5	5	5	4	5	5	5	82
R3	5	4	4	3	5	5	4	5	4	5	5	5	4	5	4	4	5	76
R4	5	5	5	5	4	4	5	5	4	5	5	5	5	4	5	5	5	81
R5	5	5	4	5	5	4	3	4	4	5	5	4	5	5	5	4	5	77
R6	5	4	5	4	5	4	5	4	4	4	5	4	5	3	4	4	4	73
R7	5	5	4	5	4	4	5	5	5	5	5	5	5	5	5	4	5	81
R8	4	5	4	3	4	4	5	3	5	5	4	5	5	5	4	4	5	74
R9	4	5	5	5	5	5	3	4	4	5	4	4	5	5	5	4	4	76
R10	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	85
Total Score																		790

Figure 15: Respondent's score (user acceptance and functionality test)

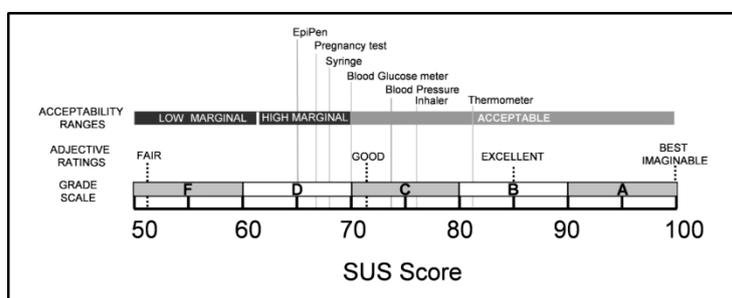
Figure 15 shows the results of respondent’s score from the user acceptance and functionality test. The of User Acceptance and Functionality Test consist of 17 questions and involved by 10 target users. The total respondent’s score is 790.

Table 7: Questions of user acceptance and functionality test

No	Questions
Q1	I think Backpacker Guide Application is easy to use
Q2	I think Graphic User Interface design is beautiful
Q3	I found the tourist spot information in Backpacker Guide Application is useful
Q4	I found the Search feature in Backpacker Guide Application is helpful
Q5	I found the Category feature in Backpacker Guide Application is helpful
Q6	I found the Bookmark feature in Backpacker Guide Application is useful when my mobile phone is in offline mode
Q7	I am satisfied with the structure and organization of information in Backpacker Guide Application
Q8	I always knew where to access the features that I want in this application
Q9	I will use this Backpacker Guide Application when travelling in Malaysia
Q10	I can add location marker on map in Add Tourist Spot fragment.
Q11	I can add images in Add Tourist Spot Fragment
Q12	I can submit the new added tourist spot information successfully in Add Tourist Spot fragment
Q13	I can add bookmark to the tourist spot description in the Description page
Q14	I can route with Google Map after clicking on the navigation button in Description page I can delete the bookmark records in Bookmark fragment
Q16	I think the functions provided in Backpacker Guide Application are working well without error
Q17	I can understand the function of every button in Backpacker Guide Application. (Eg: Sign-Up button, Sign-In button, Bookmark button, Delete button and others)

Table 7 shows the questions of User Acceptance and Functionality Test for the target user to carry out the beta testing.

$$\begin{aligned}
 \text{System Usability Scale} &= \frac{\text{Total Marks}}{\text{Overall Total Marks}} \times 100\% \quad \text{Equation 1} \\
 &= \frac{790}{850} \times 100\% = 93\%
 \end{aligned}$$



The System Usability Scale shown in Figure 16 is used to determine the acceptance range of the application according to the result of Respondent’s Score from the User Acceptance and Functionality Test which shown in Table 7. The data of User Acceptance Level and Functionality are analyzed by using the Equation 1 and the overall percentage of system usability scale shown is 93%. Therefore, this high percentage indicates that the Backpacker Guide Application is easy for the user to use and manage.

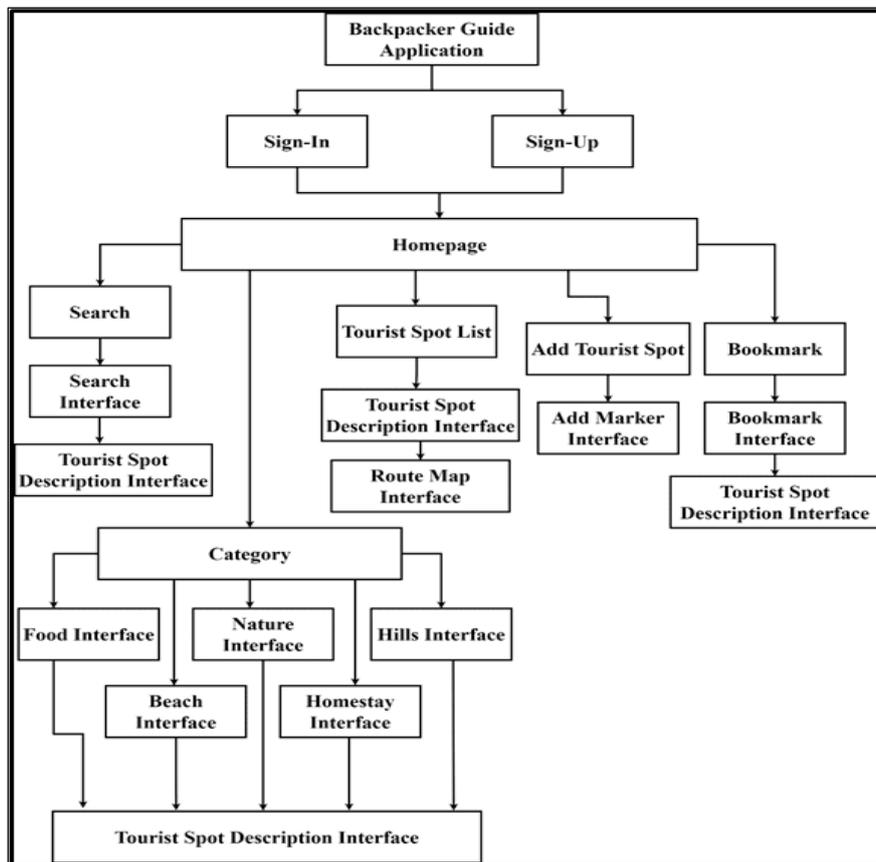
5. Conclusion

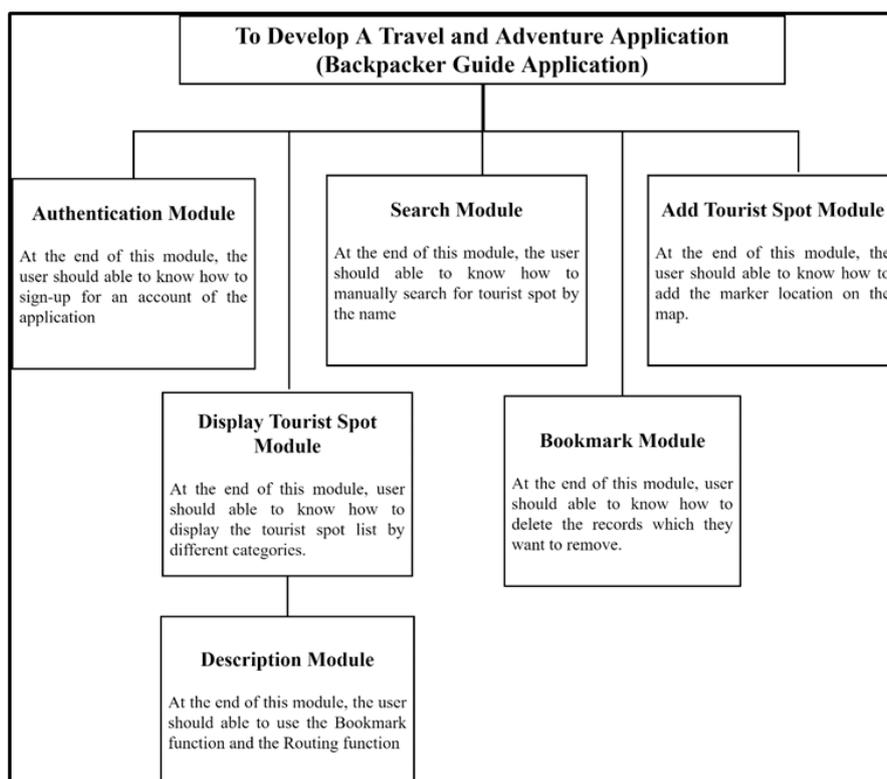
As a conclusion, Backpacker Guide Application has successfully developed using Agile methodology and is suitable for the target users to use during their backpacker trip. The high percentage of SUS result indicates that the application is easy to use by the target users and the functionality of the application are working well without errors. The objectives are achieved and the feedbacks from the user have been reviewed and analyzed. On the other hand, the advantages of the application are identified such as routing user by map and can be accessed in offline mode. However, the limitation of this application is it does not fully support by offline mode. Therefore, for future enhancement by adding functions such as real time tracking of user's location and functioning in an offline mode can be great added value to the application. Lastly, it is hoped that this application will benefit the target users.

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Appendix A





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