Smart Tourism Guide Application Using Location-Based Services-Go.Travel

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Abstract

This research paper presents the creation of an assistive application that allows travellers to use tourism-related services in Malaysia to improve their travel experience. The objective of this project is to develop and enhance a Smart Tourism Guide Application, Go.Travel based on the limitations discovered. Tourists will be able to travel more efficiently and have a better travel experience in Malaysia with the use of the proposed application.

Keywords: Smart Tourism Guide Application, Smart tourism technology, tourism-related services, tourism industry.

1. Introduction

1.1. *Background*

According to World Tourism Organization, tourism is "a cultural, economic and social appearance involving any mobility of persons for business or own reasons to nations or locations beyond their general circumstance." A significant aspect of a smart city is smart tourism. In societies globally, tourism is among the key elements of economic development. Attracting new visitors from various regions of the globe has become a crucial demand of tourism. Smart tourism can be defined as the use of ICT to implement innovative tools and techniques for enhancing tourism, comparable to smart cities. [1] Technological capabilities including mobile networking, Information and Communications Technology, VR technology, cloud services and artificial intelligence depend on smart tourism. It integrates tourism's natural, information, public, and economic resources with these tools to offer intelligent incentives for tourism. [2] The goal of smart tourism is to enhance the effectiveness of resources development, optimize productivity and, by utilization of innovative techniques and processes, to achieve sustainability. The concepts of smart tourism are focused on improving the experience of tourism, improving the efficacy of resources development, optimizing the attractiveness of destinations, with such a focus on continuous aspects. Through utilizing and analysing information gathered across infrastructural facilities and social relationships, Smart Tourism has concentrated on using emerging technology to develop information into productive innovative business models. [3] Information should also be collected and delivered to promote the effective distribution of tourism resources as well as to combine macro- and micro level tourism

resources to ensure that the advantages are delivered equally. In locations with advance technologies, including smart cities, they are found to be efficient and effective. The digital Internet offers immense opportunities for travellers to browse for fascinating knowledge and to schedule their trips. Current advancements in communication and information technology enable travellers during their travels to obtain useful information on the Internet. Around 50% majority of the current tourism recommendation applications are implemented for mobile platforms. Tourism has become one of the most appropriate industries for mobile technology and mobile applications, as seems to be the trend for other communication and information technologies. There are several applications and services that enable user to optimize this search, to provide information efficiently and effectively on fascinating attractions and reviews from users.

The advantage of smart tourism not only rises in tax revenue of the country, but it also brings a lot of advantages to individuals. [4] The most common challenge that tourists faced is confused about what to do and where to go while they travel to a city. It is more dangerous if tourists drive to the cities because they are unfamiliar with the environment, it can cause panic on tourists. These factors can be taken into consideration by smart tourism to figure out the best way to guide tourists during their tour. Using smart tourism technology, tourists can understand and enjoy the destination they are visiting. Besides, the travel guidance helps to guide tourists through all the fascinating destination in that area. Smart tourism technology allow tourist to browse for the best accommodation, transportation, restaurant, and destination to plan and arrange their fulfilling trip. Smart tourism technology provides self-guided tours that is more efficient and effective compared to the traditional multimedia tours guide. In 2018, the huge technology company, Microsoft has announced their collaboration with Guide Dogs to create the app called Soundscape. They aimed to put people with sight loss at the heart of the development of the new Soundscape app, enabling them to influence its design and test the product. Soundscape application allow individuals with sight loss to travel around the cities more efficient and easily. The application enhances individuals' awareness of the world as they walk, assisting them to go anywhere they want to go [5]. Hang out with friends, rush to the classes and travel to a new city are all typical activities that can be more satisfying for almost 300 million people with sight loss globally and cause less anxiety. Apart from offering audio guide of a destination, smart tourism application also can display the architecture, buildings and environment that appeared in the present, therefore tourists can understand and know how the buildings and the environment is developed over the years. [6] Furthermore, a simple design for providing feedback can be offered by individually designed applications. Tourists can provide feedback after visiting a destination or restaurant for other tourists to review for the similar destination or restaurant. It is useful because it allows the tourists to understand and know about the quality and services of certain destination, accommodation, or restaurant. Self-guided tours enable tourists to travel by following their own pace, and significant benefits also provided for tourists outside the technology sector. In addition, smart tourism application can trace where tourists visited, allowing tourists to arrange their own journey. [7] Smart tourism technology also allow tourists to see the map of the destination to search for the nearby accommodation, restaurant, and destination. This help tourists to prevent wasting time for travelling to a far place. Smart tourism technology allows tourists to make friends around the world through the travel forum. Tourists can share their own experience on travelling to a fascinating destination in the travel forum. Other tourists who saw it can also give comment on their post. Lastly, smart tourism technology allows tourists to read online latest news through their mobile device. They can know what happened recently through the online news.

1.2. *Aim*

This research project is aimed to develop a user friendly, convenient, and efficient smart tourism guide application, Go.Travel that runs on mobile platform to help all the tourists in Malaysia to maximize their travel experience.

1.3. *Objectives*

i. To review on existing Smart Tourism Guide Application and compare it to discover the advantages and limitations.
ii. To enhance the proposed Smart Tourism Guide Application to improve user's experience based on the limitations discovered.

iii. To design and develop a Smart Tourism Guide Application with all the functional requirements and non-functional requirements that are stated.
iv. To evaluate and test the proposed Smart Tourism Guide Application with other users to make sure that all the features are working well.

2. Systematic Review

Reviews on existing travel guide mobile application are essential to understand the application's functionality and how well the design is. It is a vital part of having a new idea and avoiding the application's weakness.

TripAdvisor is an online travel company that allow users to access its application through web and mobile devices. It provides a lot of functionality, and the design of its application is modern. This application also has location-based services and map which allow users to browse for nearby accommodation, restaurants, and destination. Using TripAdvisor, users can search for Hotels, Things to Do, Restaurants, Holiday Rentals, and Flights, it will recommend the best item for users. There is travel notice in TropAdvisor for users to read the online articles. Besides, users can share their own travel experience on the travel forums. Users also can communicate with other travellers who has the same interest with themselves. Users also can create and save a trip that is interested to travel in the future. To create trip and communicate with other travellers, users are required to create a profile for themselves. The benefits of TripAdvisor are it has variety of functions that allow users to plan and organize their trip more efficient and effective. Besides, users can share their experience and other travellers can comment their own opinion or idea of it. Lastly, there are a lot of reviews about the destination, restaurants, and accommodations. The limitations of TripAdvisor are it contain a lot of bogus reviews which make users hard to evaluate for a destination, restaurant, or accommodation. Besides, the home page of it has many sections which cause it to become complicated, users need to scroll through it for a long time to see all the information.

PocketGuide is the first and world's leading smartphone app, focused on GPS, audio, touring and storytelling. PocketGuide is reviewed because it provides audio guide tour that can help blind people in the world. It also provided map for users to see nearby places. If users interested in certain city, they could read their history and information in the city info. Moreover, users can create or join a travel group to travel together with their friends. Lastly, there are tour tickets for users to search and purchase for it. The benefits of PocketGuide is users can experience clear audio travel guides for more than 100 major cities throughout the world. Besides, users can use their device's integrated GPS to see their current location on a map. Moreover, users can listen as your audio tour guide provides insights to the history and culture of cities. All the map and review content is stored locally on your device so there is no need for an Internet connection. The limitations of PocketGuide are user need to purchase the audio guide.

Foursquare is a city guide application which assist users to explore and search details about attractions and restaurants. Foursquare is reviewed because users can connect with their friends. Users can connect Foursquare to users' personal contact, Facebook and Twitter account, it assists users to discover friends in their contact, Facebook and Twitter who are also using Foursquare application. This application will update users what their friends are doing after they followed their friends in Foursquare. Besides, Foursquare provide the check in function which is very useful. After users visiting a place, they can press check in. Foursquare will update their status. Therefore, their friends will know where they go and when they reached. Benefits of Foursquare are it good recommendation function. Besides, users can leave their reviews after visiting a place. Furthermore, users can earn badges and mayorships. For example, if users visit certain place frequently or as an active user, they will be rewarded due to their loyalty. Lastly, users can see history of places that is visited before and can bookmark the place that users is interested and want to visit it next time. The only limitation of this application is users are required to create an account before accessing to this application.

Tourplus is a tourism application founded in Malaysia that provide local tourism guides to users. The reason to review Tourplus is because this application provides a day tour package to users. It allows users to explore hidden gems of a place. After users booked a day tour, they can connect with a driver-guide within 2 hours. The person will guide users personally. Besides, Tourplus

also provide multi-day tour for users. There are many 3 days 1 night's package of beautiful cities and destination. The benefits of Tourplus are users can book flight tickets in this application, it will recommend users the most suitable flight tickets. Besides, users can book a day tour or multi-day tour package with an experience driver-guide which allow users to enjoy the best moment of their trip. There are also review leave by other users for the tour package. Users can look on it and compare to find the most appropriate tour guides their trips. The limitations of Tourplus are it only allow users to search for nearby restaurant and some stores. Users are unable to find some interesting attractions or destination to visit. This application is lack of recommendation that allow users to decide their choice.

Yelp is a famous online directory for exploring attractions, restaurants, and entertainment. Yelp is reviewed because users can connect the application with Facebook and address book. It will help to update their friend's status. Yelp is reasonably user-friendly. To access the feedback information and data of a company on Yelp, users do not need a username. It increases the likelihood that users will check up your profile without any sign-up trouble through a relatively easy procedure. The benefit of Yelp is it annually draws 150 million tourist arrivals each month. [8] It means a great deal of attention can be provided to your company by the platform. Besides, Yelp provide a lot of trustworthy reviews. It will filter the reviews and suggest all verified reviews that is trustable. Limitations of Yelp is Yelp normally requires companies to agree to a 1-year deal on their platform. While this is far more of an assumption than a guideline, it can be a complicated challenge to choose to eliminate a paid existence well before 12 months are over. Besides, for certain small enterprises, upgraded listings are expensive for them. The expense of getting an upgraded listing is reported to be at minimum $350, although authorized rates are not released. When they involved in upgraded listings and advertising, they are encouraged to call Yelp personally.

Klook is an online tourism booking site with a lot of main attractions worldwide. Users are allowed to customize and arrange their tour schedule. The reason to review Klook is because it is user friendly application, all the detailed information of each destination with ratings is in one area, users can access to it easily. It contains a lot of categories which let users to search for certain category of information. The benefits of Klook is it provide instant confirmation to users. [9] After users' book for tickets for their trips, they will receive their voucher once they completed their booking procedure. Besides, the booking procedure is very fast, all the transaction is fast and smooth. Moreover, Klook has a good customer service, there are few customers service team that are always prepared to assist users. The limitation of Klook is users are unable to search nearby destination, restaurants, or accommodation.

Table 1. Comparison table between Existing Tourism Guide Application

	TripAdvisor	PocketGuide	Foursquare	Tourplus	Yelp	Klook
Location-Based Services	✓	✓	✓	✓	✓	✓
Web application	✓	✓	✓	✓	✓	✓
Mobile application	✓	✓	✓	✓	✓	✓
User Profile	✓	✗	✓	✓	✓	✓
Nearby Suggestions	✓	✓	✓	✓	✓	✗
Map	✓	✓	✗	✗	✗	✗
Destination Recommendations	✓	✓	✓	✓	✓	✓
Accommodation Recommendations	✓	✗	✗	✗	✓	✓
Restaurant Recommendations	✓	✓	✓	✓	✓	✓
Flights Recommendations	✓	✗	✗	✓	✓	✓
Transportation Recommendations	✗	✓	✗	✓	✗	✓
Travel Forum	✓	✗	✗	✗	✗	✗
Reviews	✓	✗	✓	✓	✓	✓
News and Notice	✓	✗	✗	✗	✗	✗
City Info	✗	✓	✗	✓	✗	✗
Save places	✓	✗ (Need download the tour)	✓	✗	✓	✗

According to table 1 above, the major limitations of existing smart tourism guide application is the travel forum and travel news features. There is only TripAdvisor application that allow users access to the

travel forum to share their travel experience. However, TripAdvisor is an application not mainly for Malaysia, there are different other countries category of travel forum. Therefore, less posts is shared in travel forum of Malaysia. Besides, it is confused and complex for users when they wish to read some stories and travel experience shared by other tourists in Malaysia. This limitation will be improved in the proposed smart tourism guide application. The travel forum will be provided in the proposed application. Besides, the design and interface is easy to navigate and well categorized so that users can share their travel stories and experience or read other tourists travel stories with more satisfaction and efficiency. Another limitation which is travel news of existing application. There is only TripAdvisor provide travel news and notice features to make announcement of some important notice or some travel guidance information. However, the news and information provided by TripAdvisor is not sufficient for tourists and the news are seldom updated. In the proposed application, this limitation is improved. Different type of news and information in Malaysia will be provided sufficiently. Besides, the latest news and information will always be provided for users to get updated of the latest things happening around. Moreover, Tourplus is a smart tourism guide application created in Malaysia. However, there are some limitations in this application. One of the limitations is there are no map provided in this application for users to look on it and check for nearby places, map allow users to check a wide range of places more accurately and it is scalable. Therefore, this limitation is solved in proposed application. A map will be provided for users to press on it and check for nearby places. Users are free to zoom in and zoom out for the map to see clearer about the places around the area. In addition, Tourplus does not have the feature of save places, it is important for users to save the places when they are interested on it. Users are required to search again the places to see the information about these places after they quit the application. This limitation is addressed in the proposed application. In the proposed application, users are allowed to save the places if they are interested. Therefore, users can check on the save collection next time if they want to see the information of places that is saved previously.

3. Methodology

3.1. *Research Method*

Online survey was chosen as the research method used to collect data for this project. Conducting online surveys as quantitative data collection will collect broad information. The online survey will be done by questioning people through Google form. The google form survey questionnaire contains a set of total 18 structured questions and will be generated and sent to 120 respondents. The target participants are focusing on university students. The respondents can complete the google form survey questionnaire over the Internet through filling out the form. The duration for collecting data from the 120 respondents is 7 days. After 7 days, all the responses will be gathered, and the data collected will be analysed.

3.2. *System Methodology*

Iterative development is chosen as the system methodology for this project as this project is developing a Smart Tourism Guide Application, Go.Travel, which will be slightly complex because it included many features in the application. The reason for choosing iterative development as the system methodology for this project is because it is much more appropriate for this project and reliable compared to other system development methods. A higher quality of Smart Tourism Guide application can be developed and proposed using iterative development method as it spends more time in the design and prototyping phases to ensure that the application is completely tested to meet users' expectations and satisfaction. The proposed application requires more time in the design phase to be enhanced and improve all the weaknesses. Using iterative development method will have more time in the design phase to solve all the defects and spend less time on documentation.

4. Results and Findings

After all the survey form is completely done and collected from the 120 respondents, the data will be analyzed based on the responses from the respondents.

According to the data collected from the 120 respondents, 65 male respondents and 55 female respondents have

participated in the survey. Most of the respondents are in age group of 18-24 years old and their highest education are pre-university or foundation as the targeted participants are focusing on university students. 75 of the 120 respondents have used before Smart Tourism Guide Application, it determines that they will be familiar with smart tourism technology. However, 45 of the 120 respondents may not be familiar with smart tourism technology as they did not used before any smart tourism guide application. Most of the respondents strongly agree that it is important to understand the information of the destinations before they travel there. This result in the news and information feature in smart tourism guide application is very important for all the respondents to get updated with all the latest news and information regarding the destinations. Besides, most of the respondents agree that bad impression of the places will affect their intention to revisit the destinations. Therefore, it is important to maintain the good impression of the tourists so they will have more intention to revisit the destinations. Go.Travel is to help all the tourists to have best experience during their trip so they will have good impression of the places. This result in increasing rate of intention to revisit the destinations. Furthermore, most of the respondents think that the feature of recommendation of nearby place is very important as they strongly agree that the recommendation of nearby places could solve their trouble on deciding where to go. Therefore, this feature will be added into Go.Travel to help in recommending all the nearby places of certain area. Moreover, most of the respondents strongly agree that online communities can allow them to understand more about the knowledges and cultures of other destination. Therefore, the feature of travel forum will be added into Go.Travel to allow the respondents to share their travel experience or story to other travellers. In addition, most of the respondents strongly agree that reviews and ratings of a destination is important for them when planning for a trip. Therefore, the feature of adding review and rating will be added into Go.Travel to allow the respondents to add their review and rating for certain place so other travelers can look for it while planning for a trip. Moreover, most of the respondents would like to use Smart Tourism Guide Application in the future. It results in they would be interested to use Go.Travel. Therefore, Go.Travel will be developed to meet all user's expectation so the users will be satisfied with Go.Travel and continue to use it in the future. Lastly, nearby recommendation of places as well as news and information is the top 1 and top 2 features that will attract respondents to use it. Therefore, this 2 features will be focus more in the development of proposed Smart Tourism Guide Application, Go.Travel. It will be designed to become more attractive and user-friendly so that it will achieve user's expectation and satisfaction to provide the best travel experience for users.

5. User Interface Design

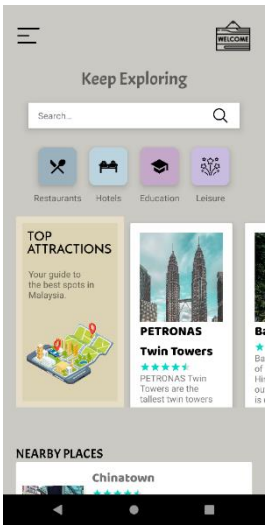

Fig. 1. Homepage

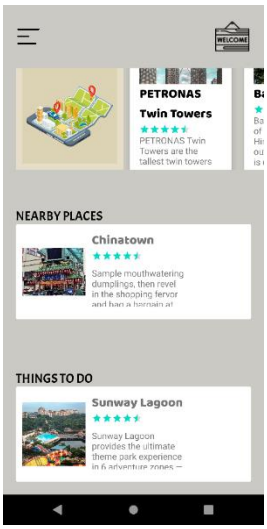

Fig. 2. Homepage

Figure 1 and 2 above shows the homepage of Go.Travel In the homepage, there are side menu bar icon that allow user to perform more tasks in Go.Travel. Welcome board icon that allows user to login or register for an account. Search bar that allows user search certain place. Some categories of places that allow user to look for category of certain place. There are more categories provided in all categories page. Top attractions, nearby places, things to do are recommended in the homepage. User can swipe to view more top attractions, nearby places or things to do that are suggested by Go.Travel. All the places are nearby Kuala Lumpur area as Kuala Lumpur is set as the location for the mobile emulator. For first time users, they can click on the welcome board icon to register for an account.

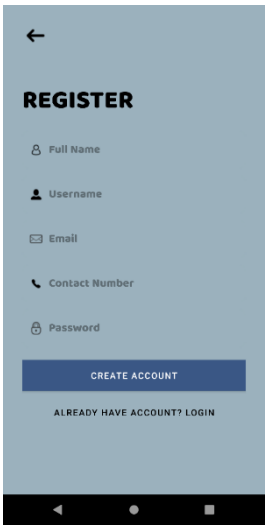

Fig. 3. Register

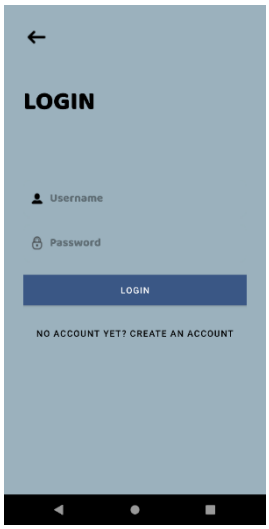

Fig. 4. Login

Figure 3 and 4 above shows the registration page and login page of Go.Travel. Users can fill in the required information in the registration form to register for an account. The given account information will be authenticated to ensure that it is a valid information. Users are required to enter username and password to login to their account. Only registered users can login to their own account.

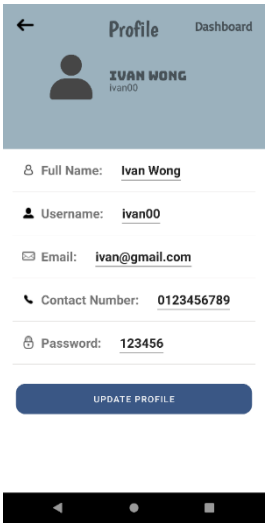

Fig. 5. Profile

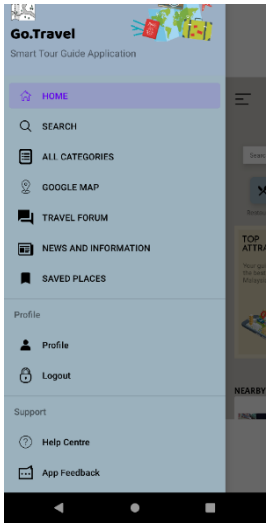

Fig. 6. Side Menu

Figure 5 above shows the profile page of each user. All the user's personal information will shown in this page. Users are free to edit their profile information. Figure 6 above shows the side menu of Go.Travel. It shows all the features can be performed in Go.Travel.

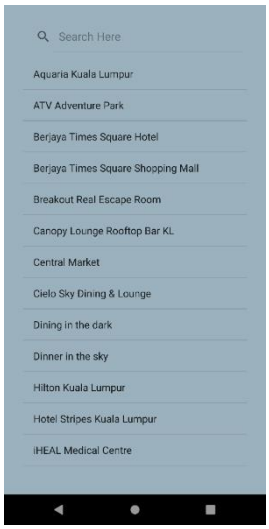

Fig. 7. Search

Fig. 8. All Categories

Figure 7 above shows the search feature in Go.Travel. Users can search for all the certain places to view the detail information for each place. Figure 8 above shows all categories page. All the places in Go.Travel is divided into total of 6 categories which is restaurants, hotels, education, leisure, shopping and medical.

Fig. 9. Nearby Hotels

Fig. 10. Detail Information

Figure 9 above shows all the places in hotels category. Users can search for the category of places to view all the places for each category. Users can click on each place to view the detail information page for each place. Figure 10 above shows the example of detail information page for each place.

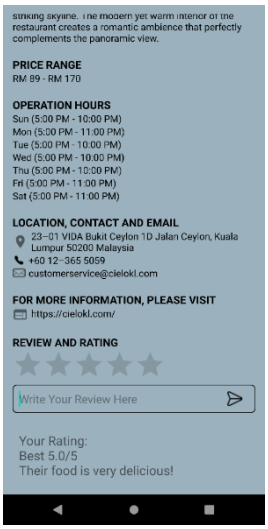

Fig. 11. Rate and review

Fig. 12. Google Maps

Figure 11 above shows rate and review feature in Go.Travel. There is rate and review section in the bottom of detail information page for each place. Users can write their own rating and review by click on the amount of star users want to rate and write their description below then click submit. The rating and review of user will shown in the bottom of rate and review section. Figure 12 above shows the Google Maps feature in Go.Travel. Users can open Google Maps in the application to view nearby places based on user's current location.

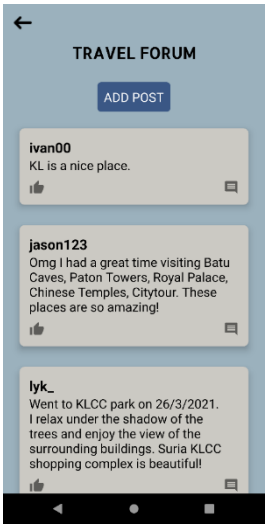

Fig. 13. Travel Forum

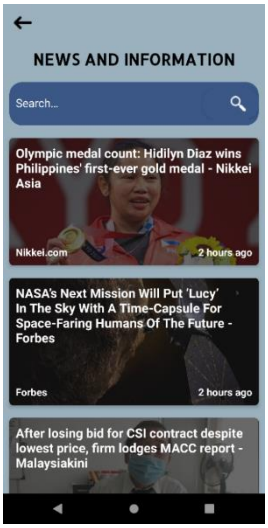

Fig. 14. News

Figure 13 above shows travel forum page in Go.Travel. Users can share their travel experience or story in the travel forum by clicking on add post button, then write their username and the description and press submit. The new post will be added in the travel forum. Figure 14 above shows news and information feature in Go.Travel. Users can read all the latest articles provided in the news and information page.

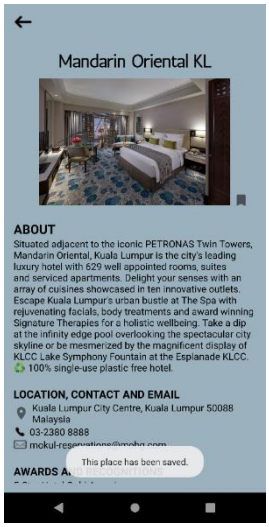

Fig. 15. Save Place

Fig. 16. Saved Places

Figure 15 and 16 above shows the save place feature in Go.Travel. Users can proceed to detail information page for each interested place. They can click on the save button beside the image as shown in figure 15 then the place will be saved into the saved places collection as shown in figure 16.

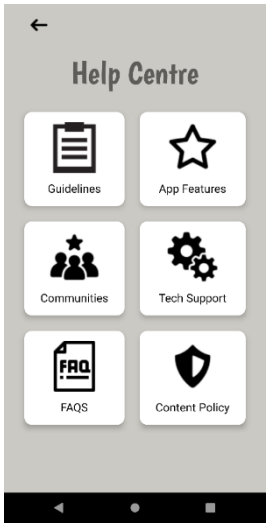

Fig. 17. Help Centre

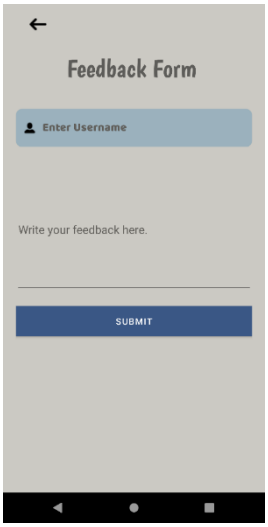

Fig. 18. Feedback Form

Figure 17 above shows the help centre in Go.Travel. Help Centre provides several type of documentation for users to read to have more understanding regarding all

the features, guidelines, and rules in Go.Travel. Figure 18 above shows the feedback form provided for users to fill in and submit their own feedback. They can send feedback or opinions to the developer for future improvements.

6. Conclusion, Limitation and Recommendation

For conclude, the research project's objectives are clearly outlined in the methodology procedure, which is used to carry out the entire process for solving the issue found in existing application. The purpose of this project is to develop a user friendly, convenient, and efficient smart tourism guide application that runs on mobile platform to help all the tourists to maximize their travel experience. The research and systematic review on existing application had been carried out to determine the existing issues. A Smart Tourism Guide Application, Go.Travel was designed and implemented to meet all the objectives and improves all the existing problems. The proposed application was implemented using Java technology and is compatible with Android-based mobile devices. Although it not perfect, but it had successfully met all the objectives and improved the user's experience based on the feedback from the participants that participated in user acceptance test. The proposed application may continue to be developed and enhanced in the future.

The proposed application is not in a perfect condition due to several limitations for this project. The main limitation for this project is the developer constraints such as lack of programming knowledge to implement the proposed application. Besides, limited time is another constraint for this project. A better output of proposed application can be produced if there is more time provided. Developer has limited time to do research and learn knowledges and skills needed to develop the proposed application. It causes the developer to face several problems while implementing all the features in the proposed application. According to the feedback from the user acceptance test, there are several limitations mentioned by the participants. Some of the pages in the proposed application is slightly laggy. Besides, less category of places is provided in the proposed application. Furthermore, Google Maps does not have search function for users to search certain place or nearby suggestion of places. Moreover, like and comment feature in travel forum is not working. Lastly, the search feature in news and information is not working.

All the recommendation and feedback from users will be taken into consideration for the future enhancements and improvements to the proposed application. The proposed application is an android-based application, it can be improved to support other platforms such as IOS, windows and so on. It will result in increasing numbers of different kind of users to use the proposed application. Besides, the application's adaptability with the device's screen resolution and size may be improved to make it more dynamic. The proposed application will become more attractive and able to capture potential user attention by being built to be compatible with multiple screen sizes and resolutions. Additionally, forgot password feature can be added in Go. Travel to allow users change their forgotten password in login page. Furthermore, more categories of places can be added into the proposed application to provide more choices for tourists. Moreover, search feature can be added in Google Maps to allow tourists to search for certain place or nearby suggestion of places. In addition, like and comment feature can be added for each post in travel forum to allow user to interact with other user. Lastly, the proposed application can be improved to allow tourists post image with description in the travel forum so that other tourists can view the shared destinations by image and not imagination.

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