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Development of Food Giver Mobile Applications by using Android Studio

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Abstract: A statistic provided by Solid Waste Management shows a high percentage of solid waste are disposed at the landfills are comprised of food. It is also reported that Malaysians produce almost 16,000 tons of waste food everyday. The solution that was proposed in this paper is to develop an Android smartphone application that can become a medium for people to give extra food that they have to other people who are in need of food and in at the same time can help to reduce the number of food waste created. The main objectives of this project were to develop an application for Android by using Android Studio software that can reduce food waste and helping those in need. Second, to create an application that is connected to a database where it can store apps and user data. The last objective was to analyse the effectiveness of the applications in terms of apps performance. Android smartphone applications were successfully made where users can post and share their food through the apps to all of the other users. The interface created was user-friendly and the Firebase platform was used as the back-end server for this project. The method that was used in approaching this project is by using the Software Development Life Cycle (SDLC) method where detailed steps were taken during the development of the project. A survey from 50 respondents showed that 78% of the respondents agreed that the development of the apps can reduce food waste and can help other people at the same time. More future recommendations are needed to improvise the efficiency of the app. An app has been successfully created where it can achieve the objectives and tackle the main problem have been created.

Keywords: Food Waste, Mobile Application, Android Studio

1. Introduction

The year 2020 marks a new place in history where a pandemic occurs in all around the world that is cause by an infectious disease call COVID-19. This pandemic has affected a lot of people all around the world and especially in Malaysia that is during movement control order (MCO) where people have been facing problems to obtain and giving extra foods for their own household. The household with

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extra foods can help other people by giving them through various method such as donating to other organizations that can helps to distribute extra food or donating to nearby neighbors. The same goes to university students where the difficulties of obtaining extra method are different depending on their location and information access. Donating or giving extra food can help to produce a more balance society where people can avoid producing a lot of waste in their household and can help less fortunate people in their struggle to obtain extra food [1].

The smartphone or mobile phone applications can be seen in a very wide use, especially in a recent year. As the device itself is easy to carry, a lot of different type of application of different purpose can be installed inside the device. This opportunity should be taken as the development of the smartphone application can be used to help in reducing the number of foods wasted around the world. One of the methods that has been use nowadays in developing the mobile applications is by using the Android Studio Software that are developed by the Google company itself. This software offers some feature that can enhance the productivity when building an Android app such as providing a flexible Gradle-based build system and providing a fast and feature-rich emulator [2]. In order to have a full access of Android's features, the development of apps using Android Studio has become a compulsory because it is provided by Google as a full-fledged development environment for Android development, debugging, testing, and packaging [3].

The production of application on smartphone has been able to help a lot of people to make their daily activities easier and neater. Furthermore, it can be seen that a lot application that have been developed today are able to provide a good service towards user and most of the user does not have any problem in using smartphone application as it is simpler. A lot of smartphone application that are provided today can give various type of service such as communication, education, entertainment, food and even transportation service. It can be said that the development of the smartphone application has been able to provide a lot of services that can reduce the burden of people in their daily basis [4]-[7].

2. Materials and Methods

2.1 Materials

Android Studio software is the official Integrated Development Environment (IDE) for Google's Android operating system application development. The software itself has a flexible Gradle-based build system where Gradle is an advanced build toolkit that can automate and manage the build process of the application development. It also allows the developer to define their own flexible custom configurations to design and build the application. This software also has a fast and feature rich emulator where developer can test their application directly in the emulator provided or they can use their own device as the emulator for the application.

Firebase is a platform under Google created to help in the development of mobile and web application. This platform serves various type of service that can be applied into a mobile application and one of the services provided is the authentication service. The Firebase Authentication can authenticate users using only client-side code and it also support social login providers such as Facebook and Google where user can login into the mobile application by using the account that have created in Facebook or Google. Moreover, it includes a user management where developer can enable user authentication with email and password that will be stored into Firebase.

2.2 Methods

The Food Giver apps require all user to create an account the first time they open the application. All the information that been given by the user will be stored into the Google Firebase Cloud under the authentication section. If the user has already created an account, they can redirect to the login page where there are required to fill in their email address and password based on the data that has been stored in the Firebase Cloud. The user will be redirect to the main page of the application where user

can see a list of food that can be received and the details of the food itself such as the food name, date created and the location of the pick-up. If a user wants to donate food, there are required to go to the donate food page where there can fill up the details of the food that they want to give such as the picture of the food, name, data food created and the location they want to put the food. Figure 1 shows the flow chart on how the Food Giver apps will work from the perspective of a user.

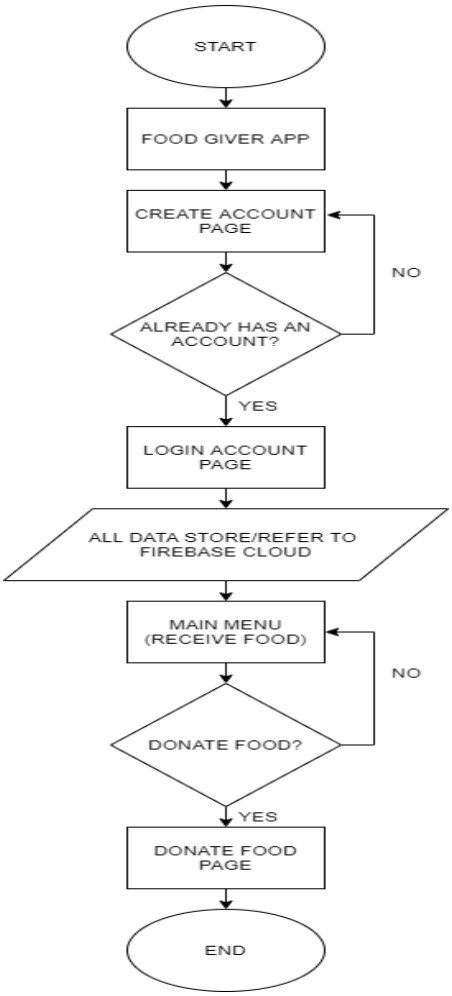

Figure 1: Flowchart of Food Giver Apps

The main feature of this apps is to allow user to create a post about the food that they want to donate to other user of this apps. Figure 2 shows that user can add their post by clicking the Add Post Page on the menu navigation bar and users will be required to fill in the food name, food image, description, location and contact detail. The information that has been submitted by user will be stored in the Firebase fire-store database where the data stored will be displayed directly at the main page and profile user post that are located at the profile page. User can edit or removed the post that has been posted by clicking the user post button at the profile page and any changes create by the user will be change in the Firebase and the main page.

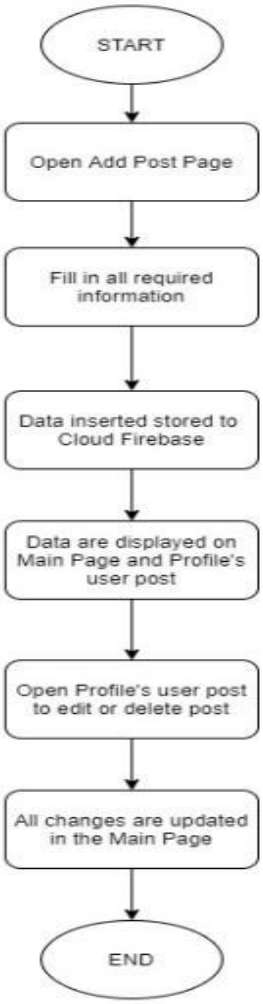

Figure 2: Create a Post Flowchart

3. Results and Discussion

3.1 Results

This apps required all user to create their own user account in order to access to the main function of the apps that is receiving and donating food that are located at the main page of the apps. Figure 3 shows the interface of the login page and create account page where all new users will see when they open the Food Giver apps. At the bottom of the page, there are a link that can redirect user to Sign Up page or the Login page depending on the user whether they already have an account or not. The required information that user need to fill in during the account registration are their user image, user name, user email, phone number, user password and user confirm password.

This apps allow all user to create their own post and all the post that are submitted will be displayed at the main page or the food receiving page and user post at profile page. The add post page that are located at the center of the menu navigation bar as this can help user to easily open the add post page and create their own post. Figure 4 shows the interface of the add post page where users are required to add the food name, add food image, description, add location and contact detail to their post.

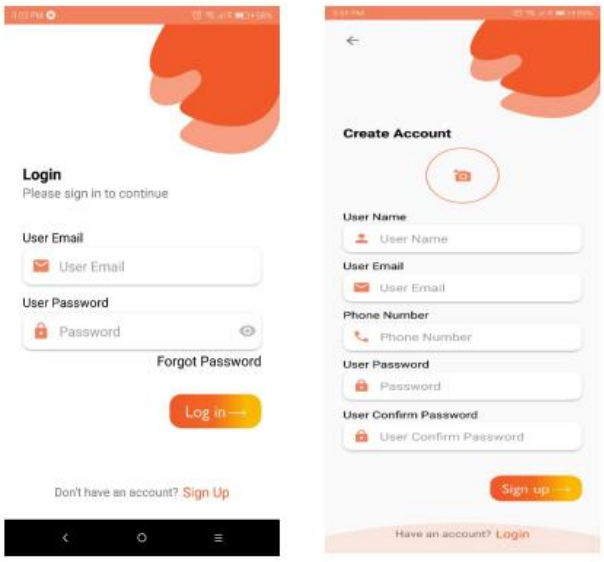

Figure 3: Interface of Food Giver Apps

Figure 4: Create Post Interface of Food Giver Apps

3.2 Discussions

All the information that are needed in the create account page and login page is required to be fill in by the user as and empty information will produce an error or warning will be shown to user that is "Email is Required" and "Password is Required". Another requirement needed for the password is that user are needed to create a password more than 6 character and any password less than 6 character will be showing an error to the user. The information that are submitted by the user will be send to the Firebase back-end service where all the data that are saved will be referred back when user wants to login to their account. The list of the user that have registered in the apps can be seen in the Firebase Authentication or Firebase Fire-store Database where a list of user id can be seen. The user date and time for creating their account can be know from the 'currentTimestamp' and their information that has been entered will be save and be seen in the Firebase.

All this information that were filled in by the user during the add post process are required as all this information can be used by other user to refer back to the user when they want to pick up or collect the food that are posted in the Food Giver apps. The interface of the food receiving page or main page where all post that are created by all user of the apps will be displayed in a scroll page method. All user

can scroll across the main page to check all the available food that has been posted and they can refer back to the information such as phone number or location that are shown in the post to be in touch with the post's user.

3.3 Survey

In the survey that has been done among 50 respondents, a questions regarding the objective of the Food Giver Apps that is can this apps helps in reducing the number of food waste and it can be seen in Figure 5 that 78% of the respondents answered that it is most likely that this apps can help in reducing the food waste. The remaining respondents that is 22% answered that this apps are likely to help in reducing food waste. Overall, most respondent agree that the development of this apps can help in reducing the amount of food waste that were produced in human daily basis.

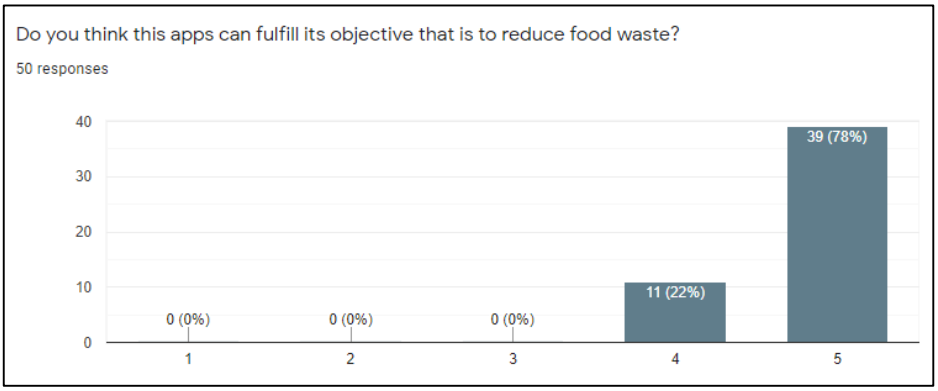

Figure 5: Respondent Answer for Survey Question 1

Next, the survey question are asking the respondent on can this development of apps help other people that in need especially during the pandemic of Covid-19 and Figure 6 shows that 78% of the respondents are agree that this apps were most likely can help the people that are in need of extra foods. Other than helping in reducing the amount of food waste, user of the apps are also contributing in doing a good deeds as the extra food that they share on the Food Giver apps can helps other people. The remaining respondents that is 22% answered that this apps are likely to help people that are in need. It can be seen that majority of the respondents agreed that this apps can helps to provide extra food to other people that are facing issues to obtain food for their daily basis needs.

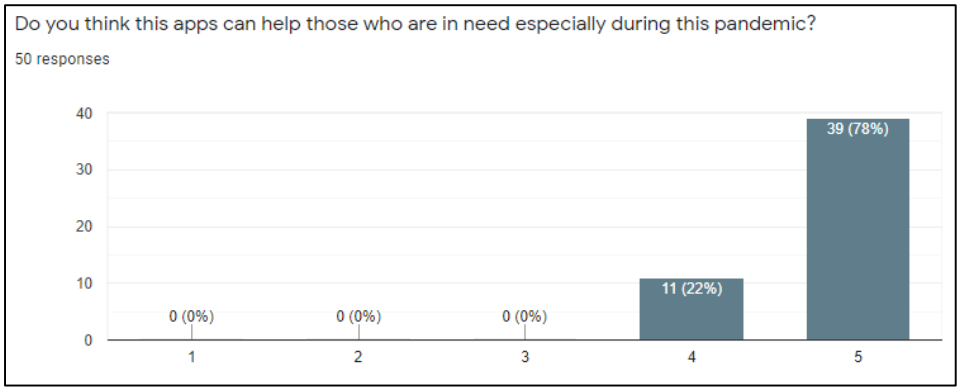

Figure 6: Respondent Answer for Survey Question 2

4. Conclusion

The development of the Food Giver apps by using the Android Studio software are successfully produced at the end of this project with all objective achieved. Based on the development process, the first objective is achieved which is to to develop an application for Android by using Android Studio

software that can help reduce food waste and helping those in need. The design and development process of this apps are achieved fully by using the Android Studio software only where the programming language that are applied in the development of the apps is Java programming language. The second objective is too create an application that are connected to database where it can store apps and user data. The software that are use for the back-end service of this apps is by using the Firebase service that are made by Google itself. The final objective is to analyse the effectiveness of the Food Giver applications in terms of apps performance. The output of the apps match the desired functions that have applied in the Java programming language and no error occur when user use this apps. Some of the extra features that can be added to upgrade the Food Giver applications so that it can deliver its functions and purpose for the user. The recommendations for the improvement of the apps are to create a date on the post so that other user can know how long have the post been posted by the post owner.

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