**ANDROID HOME SCREEN EMERGENCY BUTTON**

**WITH GPS MONITORING**

**(YOUR URGENT WIDGET)**

Ardy Jaya Putrasalim

Department of Computer Science

President University,

Cikarang, Bekasi, 17550, Indonesia

ardyjaya96@gmail.com

Abstract

GPS is one of Android feature that helps people with location related things like knowing their own location to show them the geographic around them, or to share their location to other people so the another people can see their precise location.

This application will let these nearest Public Officers to track the user depends on which widget the user click. This thesis purpose is to make emergency call response faster than before so there can be crime prevention, early disaster countermeasure, and fast ambulance service. The application is based on the Android operating system and uses the GPS (Global Positioning System) in tracking the caller’s position.

1. Introduction

Smartphone has become a part of human daily needs. Smartphones are developed to help human activities starting from education, communication, hobbies, daily activities, until business purposes. It is equipped with advance technology like camera, touch screen, GPS (Global Positioning System), and others. Among those technology, GPS usually used by people who need to use maps so the application can show the surrounding area and can direct people to certain point from their starting point. GPS can also show the distance between one point to another point, measuring speed, and estimating a trip arrival time. GPS tracking can be used by people to see another people’s position too if they allow it.

Indonesia has a crime index of 49.51 where it is a moderate category of crime compared to other countries. Cases of crime in Jakarta 2016 are recorded an acceleration compared from the previous year for 8 seconds from 12 minutes 26 seconds to 12 minutes 18 seconds. There has also been an increase in some cases of crimes such as robberies, violent, theft, rape, and other cases that undermine the security of Indonesia especially in Jakarta with the most reported crime cases[[1]](#footnote-1).

This thesis will develop an Android Application which has function to track people’s location when they click the home screen widget, so the public officer (Police Public Officer, Firefighter, or Ambulance) can approach the user faster. This application will give the user an access to set 3 *widgets* to their home screen, so the user can choose whether they want to get police, firefighter, or ambulance simply by only click the related widget. The nearby Public Officer will track down the user who click the widget by using the user’s real-time location*.* This application will be named “Your Urgent Widgets”.

People will need this application in order to feel safe, because they can call nearby police to track their position and approach them as soon as possible whenever they feel insecure or in danger. In addition, this application will also provide another option like widget to call ambulance for the time when they need it and will also provide a fire fighter widget for emergency matters that related to fire fighter job. This application’s goal is to prevent further damage or loss because of any danger may appears in daily life.

1. Limitation

To work properly, there are some requirement to for the user to set. This application has some limitation related to GPS state and function limitation, such as:

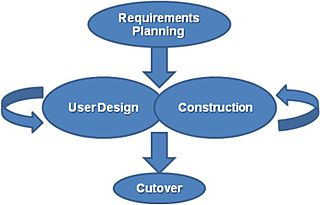
1. Cannot turn user device’s GPS on or off automatically, means that the users have to enable GPS on their phone or turn on the GPS to allow the device to be located.
2. Cannot monitor disabled phone, or turned off phone.
3. Both party (transmitter and receiver) have to enable their GPS first.
4. Limited to only 3 kind of service (police, ambulance, fire fighter).
5. Cannot make more than 1 contact in one time.
6. Method

This thesis will use Rapid Application Development (RAD) Method as the method to develop the application. RAD is the sufficient model to develop this application because this model approaches to software development is more emphasizing on the development rather than on the planning task. RAD model reduces the development time which is really useful to save time [1]. The life cycle of RAD is divided into 4 phase as shown in Figure 1.1.

1. **Requirements** **Planning**

This phase is purposed to collect and analyze every data related to the program. Since this thesis is about location tracking with android application, finding the source which related to Android, Google Maps, and GPS is a must. Within in this phase, research about the home screen widget works and also how to implement GPS tracking to the application. Create the system flow for this application can help to put the idea into the representation of the application in a shape of diagram.

Figure 1.1 Rapid Application Development [2]

1. **User** **Design**

In this phase, the database structure and the whole app interface will be designed. The user interface design of the app will be simple so the user will find it easy to operate. By analyzing the collected data from previous phase to visualize the processing of input and output. The database design structure will be made by what the system will need in order to take and create data. The database design must be simple but powerful, means that the database is easy to read and have tidy tables relation but in the same time, also consist of all data that the system need.

1. **Construction**

This phase is the main part of the app, because it’s involved with coding to run all the function that the application need. The actions include:

1. Developing the features like GPS tracking and sharing location
2. Testing functions of the feature from one device with another
3. Adjust the application by adding or changing features that the application may need or not.
4. **Cutover**

This phase will let the application be implemented. The app will be evaluated by doing some testing of the GPS and user actions and fixing the bugs. Testing the GPS function such as sending the user location in real-time to the database, and getting the location in real-time too by another device. Also checking other feature included login, copy data, and update data.

1. Experimental Results

Tests are done in order to evaluate the effectiveness of the proposed methods in previous section. Test results are described in table below.

Table1: User Test Scenario

|  |  |  |
| --- | --- | --- |
| **No** | **Scenario** | **Expected Result** |
| 1 | Open Register and Login Page | User directed to register and login page if they has not log in before |
| 2 | Register | If the ID inputted by user exist on the citizenship database and not been registered yet, then register the user by Email and Password the user input. After register success, user directed to homepage |
| 3 | Login | User directed to homepage if the email password is correct |
| 4 | Make Contact from Application | If the GPS is on, then system will send user’s location to database. If GPS is off, then there is a pop up to ask if user want to turn GPS on |
| 5 | Click home screen widget | Run the function from application to make contact |
| 6 | Cancel Call | stop the sharing location function, remove all listener, delete location data from database |
| 7 | Update Profile | User can update phone number and profile picture. User also can add hospital with user’s patient member id |

Table 2: Public Officer Test Scenario

|  |  |  |
| --- | --- | --- |
| **No** | **Scenario** | **Expected Result** |
| 1 | Open Register and Login Page | User directed to register and login page if they has not log in before |
| 2 | Register | If the working ID inputted by user exist on the work filed database and not been registered yet, then register the user by Email and Password the user input. After register success, user directed to homepage |
| 3 | Login | User directed to homepage if the email password is correct and the work id is registered |
| 4 | Set Status to Available | If the GPS is on, then system will send user’s location to database. If GPS is off, then there is a pop up to ask if user want to turn GPS on |
| 5 | Switch to not Available | If there is contact, send information that the officer not available, if there is no contact, then remove all listener and delete location data from database |
| 6 | Complete Task | stop the sharing location function, remove all listener, delete location data from database and send response to user’s device to stop user’s location sharing |
| 7 | See User’s Profile | Officer can see assigned user’s profile data |

1. Discussion

The home screen widget helps user to run a function with a single click. The database use is firebase which is suitable for this application since this application need a real time data sharing. Any information that user can change is only the phone number and profile picture to avoid any wrong data and to keep the information firmly. User also can add any hospital and patient membership to help officer get their medical record if needed. Officer is able to access the user’s information as the user assigned to them.

This system will help to reduce the time consumption of calling the officer needed and providing data by call. GPS utilization by this application has a big part on the functionality of the application as the core alongside with home screen widget button.

1. Conclusion

This thesis aims to provide a new way of utilizing the combination of home screen widget and mobile GPS function in order to share user’s real-time location with a button on user’s home screen. The goal of the thesis has been successfully achieved since all the function are working as expected.

The system used to make the real-time data sharing possible is the utilization of Google’s Firebase which taking a big part to store data such as location, profile data, and storing image. Can be concluded that Firebase is suitable to be a cloud service for any online application that needs online storage because of the easy development Firebase offer, since Android Studio support Firebase even has the Firebase Assistant to make it more efficient.

From the research for android home screen widget, it can be concluded that there are still a few of application that utilize home screen widget to the fullest capability. Most of the application are only use the widget to open the main application or only to show data (for example: clock, weather, etc.).

For the location scanning, it appears that the accuracy of GPS also affected by the internet network intensity.

1. Acknowledgements

The author would like to thank Mr. Rila Mandala, Ph.D. as the advisor of Your Urgent Widget, Mr. Nur adisukmana, M.Sc., as the Program Head of Information Technology, Mr. Rikip Ginanjar, M.Sc., and Dr. Tjong Wan Sen, also all the lecturers in Faculty of Computing and in President University for all the knowledge and wisdom that the author has ever received.

References

|  |  |
| --- | --- |
| [1] | T. I. Pedro Isaias, "High Level Models and Methodologies for Information Systems," in *High Level Models and Methodologies for Information Systems*, New York, Springer, 2014, p. 145. |
| [2] | V. Author, "Rapid application development," Wikimedia Foundation, Inc., 29 January 2018. [Online]. Available: https://en.wikipedia.org/wiki/Rapid\_application\_development. [Accessed 27 March 2018]. |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

1. R, Mei Amelia. “Kapolda Metro: Kejahatan Di Jakarta Terjadi Tiap 12 Menit 18 Detik.” *Detik.com*, Detik, 30 Dec. 2016, 08:39, news.detik.com/berita/d-3384009/kapolda-metro-kejahatan-di-jakarta-terjadi-tiap-12-menit-18-detik. [↑](#footnote-ref-1)