Android Based Emergency Button with Position Share System

L D Setia¹, S V Yulianto¹, A P Atmaja¹

The State Polytechnic of Madiun, Jl. Serayu No. 84 Madiun East Java Indonesia

Email: lutfiyah17@pnm.ac.id, atmaja@pnm.ac.id

Abstract. Development goals on this Panic Button application is to make it easier to call the nearest hospital for help. Panic Button works as a notification or alarm which tells that a danger is happening to an outpatient in emergency level and needs of immediate help. It is an android information-based which make it possible for outpatients to tell or send a notification message to the hospital medical workers when they are in an emergency problem. The system will send a notification after he/she clicks the SOS button. Using this emergency button is only to send a notification message and activate an integrated alarm. This system consists of mobile application, management information system and alarm system which was developed using Arduino Wemos D1 including ESP8266. Android application was developed using Google Firebase System as a notification system. When some one clicks the SOS button, the android application will send a data to management information system through Application Programming Interface (API). While the management information system will switch the alarm status to ‘danger’. The alarm system will check the alarm status frequently through API and if ‘danger’ status is found, it will change its status to ‘alarm’ and ring. All the hospital medical workers who are in charge of the patients who use this android application and is connected through the same system will get a notification message and they can check the source location or call the outpatients using smartphones.

1. Introduction

The usage of the latest technology can be utilized to prevent and minimalize the negative impacts of delay in handling an emergency for outpatients. One way to do it is by developing a specific information/application system to help preventing it to happen. This application is an android app that can send messages or notifications to another users [1]. These messages or notifications are a sign that an emergency or problem has happened to the sender. Besides sending notifications, it also sends a signal to the alarm system to make the alarm rings on the hospital workers’ phone.

Applications are a computer program that were created to do certain tasks by a user and programs are a set of instructions which ran by a software. Then, applications can be defined as a program in form of a software which ran by a certain system to make people’s life easier. Android applications are applications or programs which ran on android operation system or platform [2]. Android is a linux-based operating system which was developed to be used in mobile devices by Android Inc. It is a breakthrough in technology that helps its users. It is also an open source which has increasing demands. In this research, the application that was being developed is an android-based application that sends a notification to its other users (the medical workers or nurses who are in charge of the outpatients) that the sender is in a danger or a problem [3]. Beside that, it also will send a signal to the system so they can go to the location immediately.
2. Research Method

Conducted Research is a descriptive research, where the results of this research which conducted by the authors are presented in the form of descriptions, both qualitative and quantitative descriptions. Research was conducted using sub-districts case studies in Indonesia. The development of the Android-based Emergency Button Application system starts with a system requirements analysis. This step is carried out to find out what is needed in the development of the information system. At this step also being determined what device that will be used. Method of the research in this paper can be seen in the following chart [4].

The Figure above explains that information needs analysis is to get information or things that related to the needs to develop the notification application/system. NodeMCU exploration step is to get the procedure information and the possibility to be integrated with the notification application [5]. The next step is to design the notification application/system consists of system, user interface, and database design.

Fig. 1. Designing and Implementing System Step

The implementation of the information system is an activity of objectifying the information system based on needs analysis results, NodeMCU exploration, and notification system/application design by writing the program code. Examination of notification application/system is to examine its result. It is done using black box that is an examination of the program functional or notification application/system. The last step is to conclude from the result of examination and write it in form of a set of steps in a report.

3. Result and Analysis

The first step of designing and implementing Panic Button system is designing black box by exploring NodeMCU. NodeMCU is arduino board for ESP8266 Wi-Fi that can connected with computer network via wireless access point [6]. The NodeMCU also connected with alarm device, so NodeMCU can trigger or activate the alarm device. The Figure below is a Figure of an alarm that was integrated to Panic Button to prompt a notification when an emergency happens.
On the next step is the design of information system, which consists of system, database, and user interface continued with implementation. On this step, the result of needs analysis and design were made by information system/application by writing program code/script. After it’s done, the next is examination step. It is done by using a black box that is an examination of the program.

Panic Button information system was designed for 3 (three) kinds of user, that is Superadmin, Admin, and Owner. To use it, every user has to log in first. Figure 3 shows login page from Panic Button information system.

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**Fig. 2.** Black Box Design and Notification Alarm

**Fig. 3.** Interface of login page Panic Button Information System

**Fig. 4.** Interface of Dashboard of Panic Button Information System
Figure 4 shows dashboard page, where superadmin is able to manage Master Data that was store in Panic Button information system.

Figure 5 shows Regional Data, where superadmin is able to manage Regional Data that was store in Panic Button information system.

Panic Button application is already available and can be downloaded on playstore titled: Panic Button Politeknik Negeri Madiun, like shown in this Figure below:
The next step is the outpatient (or his/her family) inputting the area code of the poly where he or she is undergoing the treatment in the hospital where he/she stays. So, the system can record the exact coordinate point position where the emergency happens and is in need of help from the nearest medical workers.

4. Conclusion
Based on the results of the implementation of this system, the Panic Button mobile Application Information System is able to send messages or notifications to people experiencing emergencies who need immediate assistance. Some people are enthusiastic and feel the benefits of the system when it is already implemented continuously.

As for suggestions to improve the implementation of this Panic Button application, the results of this research are:
a. The next version is expected to have an additional feature in form of Location Image where the emergency happens, to know about the accident in more detailed ways.
b. The alternative of the “panic” message feature to be replaced with a voice note feature, so when the accident happens the patient just needs to record a voice note without taking time to type a message.
c. The alternative for Manual Alarm Button which connected to the system for the outpatients who can’t use the application.

References
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