

# **APPLICATION DESIGN (KOREMI) FOR ANDROID-BASED FIRST AID MEDIA**

Mazerianto Simanullang<sup>1</sup>, Taryana Suryana<sup>2</sup>

<sup>1,2</sup> Universitas Komputer Indonesia

Jl. Dipatiukur No.112-116, Lebakgede, Kecamatan Coblong, Kota Bandung

E-mail : Simanullang.maze@gmail.com<sup>1</sup>, Taryanarx@gmail.com<sup>2</sup>

## **ABSTRACT**

*First aid is a rescue action in an accident or an unwanted event that can occur anywhere and anytime. This incident can be a small incident or a disaster involving large numbers of sufferers. KSR PMI UNIKOM is an organization engaged in health, especially first aid consisting of members who are trained in the field of trauma and medical first aid. People in their daily lives sometimes experience unexpected events, problems that are often encountered by the community such as the difficulty of reporting the incident, the difficulty in getting first aid and the difficulty in finding the location of the first aid agents. There are several technologies that can help the problem namely Firebase Cloud Messaging to provide notification to first aid agents, Geolocation to get the location of the informer and the location of the closest member of KSR PMI Geofencing to limit the reporting area of the incident, and Infermedica is used for diagnosis. victim's condition. The test results show that with the application (KOREMI) obtained a percentage of 87.14% of the community felt helped in reporting the incident, 87.14% helped the community get first aid, 85.71% allowed the community to find first aid agents nearby and 85.71% helped community in getting information related to humanitarian activities.*

*Keywords: K, First Aid, FCM, Geofencing, Infermedica, Geolocation*

## **1. INTRODUCTION**

### **1.1. Background Issue**

*The Indonesian Red Cross (PMI) is a national association organization in Indonesia engaged in the field of social humanity. The Indonesian Red Cross always has seven basic principles of the International Red Cross and Red Crescent Movement, namely humanity, equality, volunteerism, independence, unity, neutrality, and universality [1].*

*KSR PMI UNIKOM is a voluntary corps unit of the Indonesian Red Cross within the scope of the Indonesian Computer University campus which plays an important role as a major actor in the humanitarian field, especially first aid in the event of*

*an accident or disaster in the campus area and the surrounding community.*

*Volunteers according to PMI Headquarters (Indonesian Red Cross, 1998) which are also referred to as Volunteer Corps (KSR) and PMI Volunteer Workers (TSR) are individuals who voluntarily spend / donate energy, time, thought, and special skills / skills that are it has either obtained through formal levels of education or informally (courses, etc.) where it can assist the development of the Indonesian Red Cross Society [2].*

*Based on the results of the questionnaire 71.1% of 38 community respondents still had difficulty reporting events that occurred to themselves or their colleagues who had an accident or medical problems during their activities. While based on the results of the questionnaire 73.7% of the community found it difficult to get first aid measures in the area around the accident due to the difficulty of accessing incident reports to members of the KSR PMI as perpetrators of first aid measures on various medical or trauma events.*

*There is a technology in a mobile application that can be used to create an application that is useful for reporting and detecting symptoms that occur in victims such as GeolocationAPI is a technology that can be applied in mobile applications to detect the closest location to the scene, Infermedica API is a technology that can be used to determine the type of disease experienced by patients through the symptoms entered into the API, and Firebase Cloud Messaging can be utilized as an intermediary for reporting events or accidents.*

### **1.2. Purpose and Objectives**

*The purpose of this is to build an application that is public that can help the community in accessing the assistance of first aid players. For this purpose, the objectives of this study are:*

- 1. Assist the community in reporting events that occur to themselves or those that occur around them.*
- 2. Help the community get first aid and prevent the victim's condition from getting worse.*
- 3. Helping the public to know the location of the KSR PMI members as first aid actors.*

### **1.3. Software Development Method**

*The method used in making software uses a waterfall paradigm according to Pressman (2010,*

p39). According to pressman the waterfall model is a classic model that is systematic, sequential in building a software. The following is an overview of the waterfall which includes several processes, namely [3].

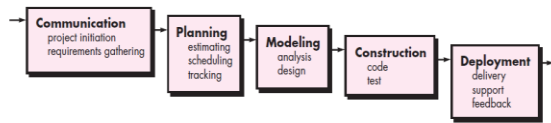


Figure 1. Scheme Model Waterfall

#### 1.4. Application Programming Language (API)

API Is a set of commands, functions and protocols that are used when building software for certain operating systems. The API allows you as a programmer to use standard functions to interact with the operating system. API is also a documentation that consists of interfaces, classes, functions and structures to build a software [4].

#### 1.5. Unified Modelling Language (UML)

According to Windu Gata (2013) the results to be achieved in OOAD modeling are documented in the form of UML, which is a standard specification language used to do documentation, making specifications in building software. UML is a methodology that is widely used by object-oriented system developers and is one of the supporting tools in development [5].

## 2. RESULTS AND DISCUSSION

### 2.1. Analysis Problems

Accidents can occur anywhere and do not know the place and the condition, in the campus UNIKOM often occurs medical problems that occur to students and lecturers both medical scale or trauma. Based on the formulation of the problems obtained by distributing questionnaires as data collection, the following problems are obtained:

#### 2.1.1. Community Difficult to Report Accident

With the variety of activities that are often carried out by the community, it is not uncommon that accidents often occur that are unplanned and unwanted. In this case the community still has difficulty in reporting accidents found in the surrounding environment. Existing data obtained based on questionnaires distributed to 38 respondents, and the results of the questionnaire can be seen in Figure 2 below:

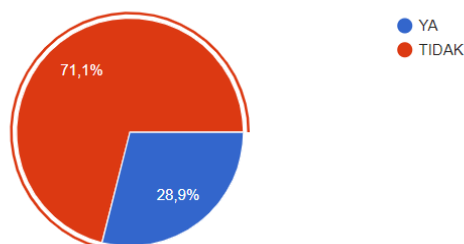


Figure 2. Community Difficult to Report Accident

#### 2.1.2. Community Difficult to Get First Aid

Difficulties of the community in reporting the occurrence of accidents that occur, impact on the first aid measures that are obtained can not be done quickly and precisely. Existing data obtained based on questionnaires distributed to 38 respondents, and the results of the questionnaire can be seen in Figure 2 below:

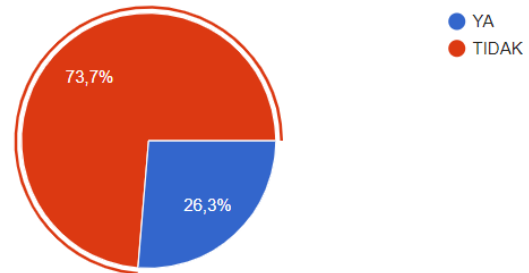


Figure 3. Difficult to Get First Aid

#### 2.1.3. Community Difficult to Know Location of First Aid Actors

The community will be very difficult to report an accident or get a first aid action because the community is still clouded about first aid, so the community will be greatly helped if they know the location of the first aid practitioners. At present the community is still having trouble knowing the location of the perpetrators of the first aid kit. Existing data obtained based on questionnaires distributed to 38 respondents, and the results of the questionnaire can be seen in Figure 4 below:

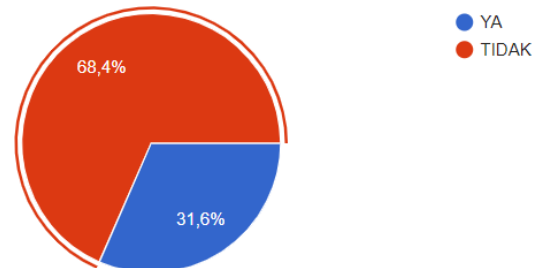


Figure 4. Difficult to Find the First Aid Actor

### 2.2. System Architecture

System analysis aims to identify the architecture to be built. The following is a system architecture image from the KOREMI application.

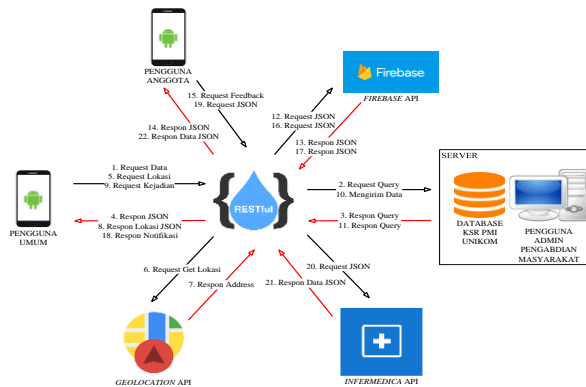


Figure 5. KOREMI System Architecture

### 2.3. Analysis of Technology Used

Technology analysis is used to find out what technology is used in building KOREMI applications and the role of functions in applying to applications. The following technologies used in the construction of this application can be seen in:

#### 2.3.1. Firebase Cloud Messaging

Firebase Cloud Messaging (FCM) is a solution for sending messages across the platform that allows you to send messages reliably at no cost. With FCM, you can tell the client application that new e-mail or other data is available to synchronize. You can send notification messages to encourage re-interaction and user retention. For use cases like instant messaging, messages can transfer payload up to 4 KB to the client application [4].

#### 2.3.2. Infermedica API

Infermedica is an Application Programming Interface that allows it to be applied into an application design for health, in short it provides an API for triage and initial medical diagnosis that can help implement an examination of symptoms by sending patient condition data such as symptoms, risk factors, laboratory test results or demographically, the AI engine in infermedica will analyze the data sent and will list the possible conditions of the relevant observations [5].

#### 2.3.3. Geofencing

Geofencing is software that is used in conjunction with global positioning system (GPS) in determining geographical boundaries or virtual parameters from a map. Programs that use geofencing can set a triggers that can provide information or notifications when a certain target enters or exits a predetermined limitation. Some of the techniques of geofencing are Geofence Area, Proximity with Point of Interest, Route Adherence, and Route and schedule adherence [6].

#### 2.3.4. Geolocation

Geolocation is the identification of the geographical location of an object in the real world and can detect the location of our existence as well as

route search as information for users on their way using the internet connection [7]. Geolocation provides device information such as latitude (Latitude) and longitude (Longitude), common sources of information obtained through the Global Positioning System (GPS), network signals such as IP, RFID, WIFI, Bluetooth MAC addresses and GSM / CDMA cell ID [8].

### 2.4. Analysis of Functional Requirements

This analysis explains the specifications of the application to be created or run. This needs analysis is illustrated using diagrams and tables. Analysis that will be explained is use case diagram, scenario use case, activity diagram, class diagram and sequence diagram.

#### 2.4.1. Use Case Diagram

Use case diagrams present the interaction between use cases and actors. Where, actors can be people, equipment, or other systems that interact with the system being built [23].

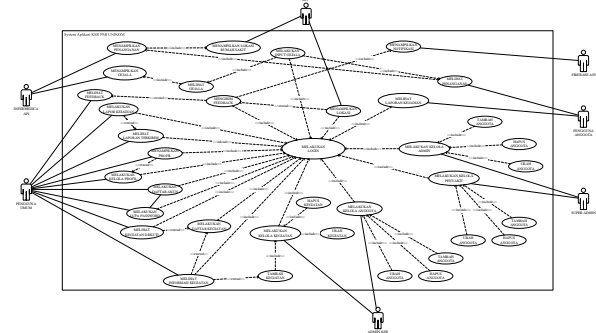


Figure 6. Use Case KOREMI Diagram

#### 2.4.2. Scenario Use Case

Scenario Use case is the result of instantiation and explanation of each Use case. Scenario Use case tells the details that happened [9].

Table 1. Scenario Use Case Register Account

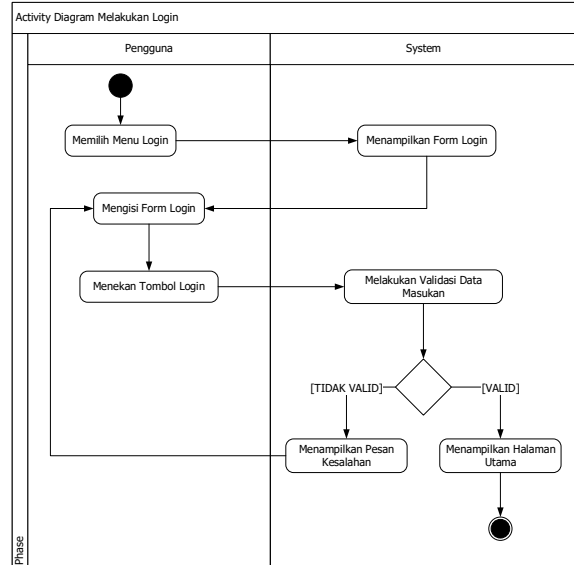
Use case Name	Register an account	
Related Requirements	SKPL - F - 01	
Goals	Displays the message of successfully adding new account data to the system	
Preconditions	-	
Successful Condition	End Successfully added new account data to the database	
Failed End Condition	Failed added new account data to the database	
Primary Actors	General User	
Main Flow	Steps	Actions
	1	The actor opens the account list page
	2	The system displays the form added account
	3	Actors fill out the account register form
	4	The system performs input data validation
Extension	5	The system successfully added data to the database
	Steps	Branching Action
	4.1	The system displays an error message
	5.1	The system displays an error message

**Table 2. Scenario of Login**

Use case Name	Perform Login	
Related Requirements	SKPL - F - 02	
Goals	Displays the main page of the application	
Preconditions	-	
Successful End Condition	Successfully entered the system	
Failed End Condition	Failed to enter the system	
Primary Actors	General User, Member User	
Main Flow	Steps	Actions
	1	The actor opened the login page
	2	The system displays login form
	3	The actor filled in username and password
	4	The system validates the username and password
5	Displays the main page of the application	
Extension	Steps	Branching Action
	4.1	The system displays an error message

**2.4.3. Activity Diagram**

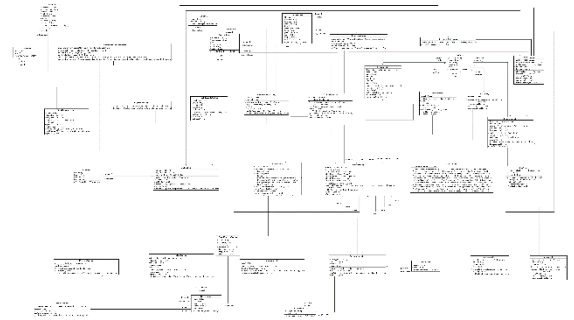
Activity diagram is an analysis that explains the running scenario of the system in the application to be built. This scenario is presented in the form of a diagram. Activity diagram is a graphical form of a scenario to make it easier to see the flow of the system.



**Figure 8. Activity Diagram Login**

**2.4.4. Class Diagram**

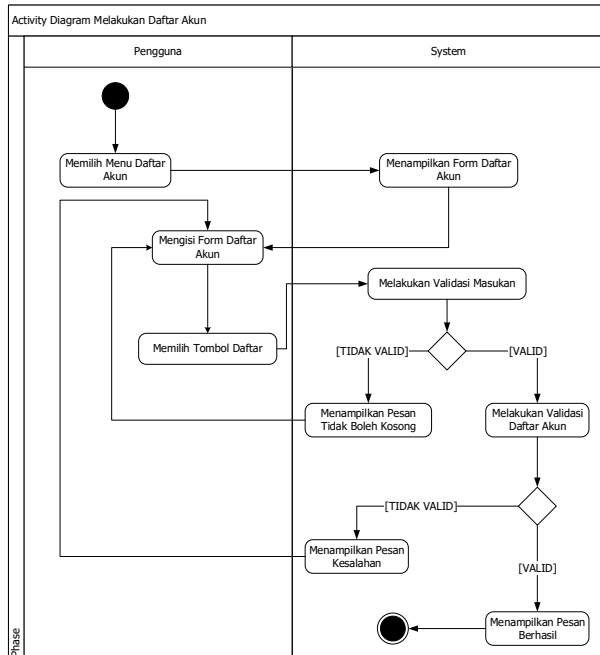
Class diagram is an analysis of relations between classes in the application to be built. This scenario is presented in the form of a diagram. Class diagrams are graphical depictions of classes to make it easier to see relationships between classes.



**Figure 8. KOREMI Class Diagram**

**2.4.5. Sequence Diagram**

Sequence diagram is an analysis that explains the plot of the program in the application to be built. This plot is presented in the form of a diagram. Sequence diagrams are graphical representations of class diagram relations to facilitate reading the plot of program.



**Figure 7. Activity Account List Diagram**

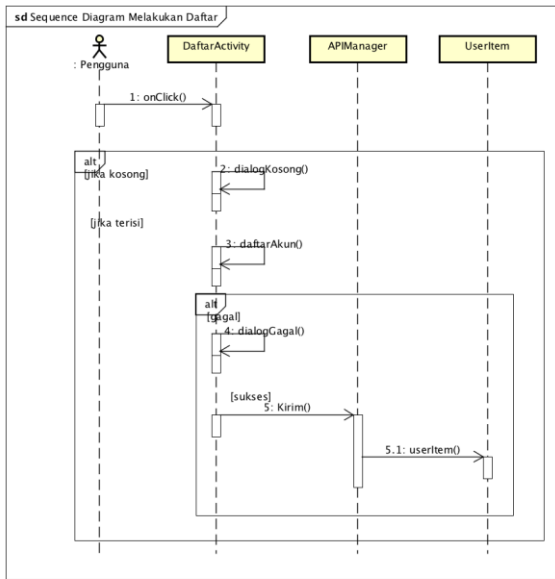


Figure 9. Sequence Diagram Conduct Account List



Figure 11. Application Start Page Interface

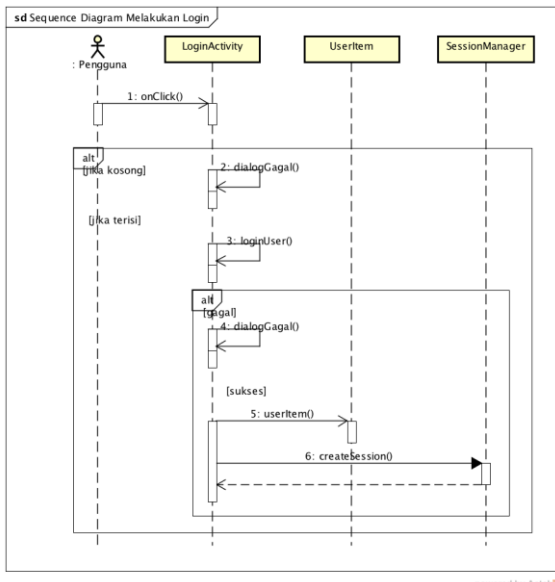


Figure 10. Sequence Diagram Login



Figure 11. Account List Interface

## 2.5. Interface Design

Interface design is a design that is used as a reference for the design of objects in the application being built. These designs are simple or rough and just give an overview on the layout of each part.



Figure 12. Login Interface



Figure 13. Genesis Report Interface

### 3. System Implementation and Testing

#### 3.1. Implementation

The system implementation phase is the application phase of the design to be carried out based on the previous system analysis. Implemented into a programming language that has been determined and the application of the system to be built in an application. The implementation discussion will be divided into several implementations namely hardware implementation, software implementation, database implementation and interface implementation.

##### 3.1.1. Hardware Implementation

The hardware implementation is a description of the minimum hardware used by the user and supports running the system to be processed. The

hardware implemented is hardware implementation on the computer that will be used as a server and hardware on the smartphone used by the user.

Table 3. Hardware Implementation on Smartphone

Hardware	Specification
Processor	QualcomMSM8916QuadCore
RAM	2GB
Rom	16GB
Screen	5 inch
Networks	3G / LTE

##### 3.1.2. Software Implementation

The minimum software implementation that supports application running. As for the software implemented in the development of applications of KOREMI is as follows:

Table 4. Software Implementation on Smartphone

Software	Specification
Operating System	Android
Android version:	5.1.1 Lollipop

### 3.2. Testing

The testing phase is an important part of the software development cycle. The purpose of this test is to ensure that the software built is in accordance with the original purpose of application development. Testing of the program itself is to ensure that the program has run well without any errors that will be experienced by the user and also to test the program so that it can be further developed based on the results of the test. The software testing method used is blackbox testing, blackbox testing focuses on complementing the functional performance of the software built. Blackbox testing method itself consists of two stages of testing, namely alpha testing stages and beta testing stages.

#### 3.2.1. Alpha Testing

Alpha testing is a test carried out by the developer involving a group of users. The test is carried out to ascertain whether the application can run well on the user's system or application users, in this test the developer carries out and records errors and problems felt by the application user.

Table 5. Alpha Testing Method Blackbox

No.	Testing Class	Testing Scenarios	Type of Testing
1.	Register	Full Name	Blackbox
		Cell Number	Blackbox
		Place of Birth	Blackbox
		Email	Blackbox
		Password	Blackbox
2.	Login	Email	Blackbox
		Password	Blackbox
3.	Login With Gmail	Gmail account	Blackbox



4.	Forgot Password	Email	Blackbox
5.	Change Password	Old password	Blackbox
		New password	Blackbox
6.	NIK Verification	Input NIK	Blackbox
7.	Report incident	Write description <sup>a</sup>	Blackbox
8.	Response Report	Contents Response	Blackbox
9.	Patient Diagnosis	GetSyhmpthom	Blackbox

Based on the results of alpha testing that has been done with the above test cases, conclusions can be drawn as follows:

1. If the data entered in the backend and frontend are correct then the system will respond as expected.
2. If the input data entered into the system is incorrect then the system will display an error message in accordance with the input error, so the user must enter the correct data so that the system functionality displays maximum results and ensures the user follows the rules that already exist in the system.

### 3.2.2. Examination

Beta testing is a test conducted objectively and is carried out by users, using an application that is built that is KOREMI Application Development for Android-Based First Aid Media. This is done to find out the extent to which the application that has been built can help ease and solve the problems that have been described in the sub-section of intent and purpose.

1. Do you agree that the KSR PMI UNIKOM application can help you report accidents around you?

Table 6. Question 1 Beta Testing

Question	certification	Value	Respondents	Value x Respondents
1.	Strongly Agree	5	7	$(5 \times 7) = 35$
	Agree	4	20	$(4 \times 20) = 80$
	doubtful	3	5	$(3 \times 5) = 15$
	Less agree	2	0	0
	Disagree	1	0	0
Total			32	130

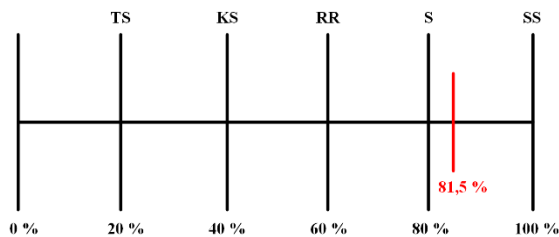


Figure 14. Graph of Test Results Beta Question 1

2. Do you agree that the KSR PMI UNIKOM application can help you get first aid if you have an accident?

Table 7. Question 2 Beta Testing

Question	certification	Value	Respondents	Value x Respondents
2.	Strongly Agree	5	5	$(5 \times 5) = 25$
	Agree	4	24	$(4 \times 24) = 96$
	doubtful	3	3	$(3 \times 3) = 9$
	Less agree	2	0	0
	Disagree	1	0	0
Total			32	130

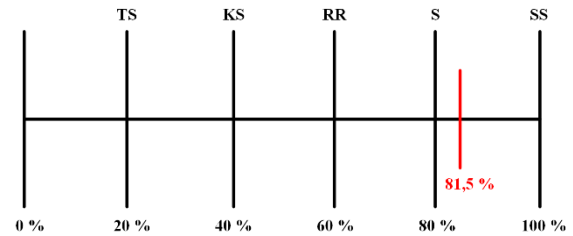


Figure 15. Graph of Test Results Beta Question 2

3. Do you agree that the KSR PMI UNIKOM application allows you to find first aid practitioners around you?

Table 8. Question 3 Beta Testing

Question	certification	Value	Respondents	Value x Respondents
3.	Strongly Agree	5	6	$(5 \times 6) = 30$
	Agree	4	18	$(4 \times 18) = 72$
	doubtful	3	8	$(3 \times 5) = 25$
	Less agree	2	0	0
	Disagree	1	0	0
Total			32	124

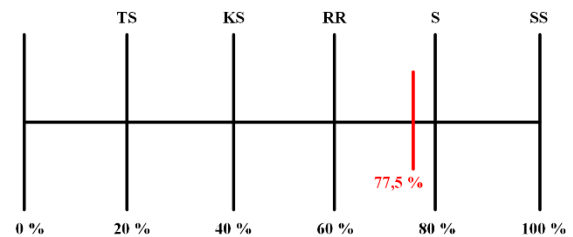


Figure 16. Graph of Test Results Beta Question 3

## 4. CLOSING

### 4.1. Conclusion

The results obtained from the stages that have been done through the process of planning, implementation, and application testing, it can be concluded about the construction of the KOREMI application for first aid media as follows:

1. Assist the public in reporting events when accidents occur to themselves or those that occur around them by sending location of latitude and longitude.
2. The application can help the community in getting first aid by providing a way of handling in accordance with the conditions of the patients pending the arrival of the first aid agents.
3. The application can help the community find the location of the first aid agents with members responding to how to handle and estimate the arrival of the first aid agents.

## REFERENCES

- [1] M. P. P. M. *Indonesia, Pedoman Pertolongan Pertama*, Jakarta: PT. Avatar Arkam Publishing, 2009.
- [2] F. N. Iswanto, "HUBUNGAN MOTIF PROPOSIONAL DAN SEMANGAT KERJA RELAWAN DI LEMBAGA PMI YOGYAKARTA," pp. 8-9, 2008.
- [3] R. S. Pressman, *Software Engineering A Practitioner's Approach 7th Edition*, New York: The McGraw-Hill companies, Inc, 2010.
- [4] FIREBASE, Google Inc, [Online]. Available: <https://firebase.google.com/docs/cloud-messaging/>. [Accessed 25 Maret 2019].
- [5] I. . L. MD, "infermedica," [Online]. Available: <https://infermedica.com/>. [Accessed 18 05 2019].
- [6] J. Priono and E. B. Setiawan, "Implementasi Geofencing dalam Mengawasi Pengiriman Kendaraan di Sebuah Perusahaan Ekspedisi," *ULTIMATICS*, vol. IX, no. 2, pp. 12 - 14, 2017.
- [7] N. Azizah and D. Mahendra, "Geolocation Dengan Metode Dijkstra Untuk Menentukan Jalur Terpendek Lokasi Peribadatan," *Jurnal Sistem Informasi Bisnis*, vol. 7, no. 2, p. 97, 2017.
- [8] F. Djuandi, "Menggunakan Geolocation Pada Cordova," pp. 1 - 9, 2015.
- [9] I. Akil, "Rekayasa Perangkat Lunak Dengan Model Unified Process Studi Kasus: Sistem Informasi Journal," *Jurnal Pilar Nusa Mandiri*, vol. XII, p. 17, Maret 2016.