

Personal Security Tracking based on Android and Web Application

Angry Ronald^{*1}, Violitta Yesmaya², Muhammad Danaparamita³

Computer Science Department, School of Computer Science,
Bina Nusantara University, Jakarta, Indonesia 11480

*Corresponding author, e-mail: aadam@binus.edu¹, vyesmaya@binus.edu², mdanaparamita@binus.edu³

Abstract

Nowadays, the frequency of abduction is increasing significantly. Information technology provide many social media which is causing the leaked of personal information where abductor can find out the information. Using social media, people can share location, life event, and anything related about their life event, these become the useful information for the abductor. To anticipate this, a lot of personal tracking device is developed, but the response is too late. Because, the family or relative of the victims will notice that abduction had happen after the victim is lost. According to the problem, this research will focus on develop the personal tracking device which trigger by the victims who own the phone based on android and web application. Whenever the abduction happens, the victim just need to click the button and the system will send a message to the relatives and family in their contact also trigger the notification to the local security. Software development life cycle that will be used is scrum which is divided into several processes like backlog, sprints, scrum meetings, and demos. The result of this research is android application for user and web application for managing application.

Keywords: decision support system; tracking application; android application; web application

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1. Introduction

Information technology provides many simplicities in human life. Social media is one of the most popular simplicity to share life event in public. Instead of many benefits comes from it, there are also become the way to collect information about the victim's life event. Abduction is one of the crimes which is increase significantly. There are a lot of tools and applications developed to prevent this crime. But, most of them are trigger the victim's family or relative. At that time, the abduction process is already in progress. So, the number of abduction victims is still high.

Children's safety is one of the issues that need attention. This is because the lack of supervision of parents against their children, especially when parents are working/traveling, not be able to supervise their children throughout the day. Mobile tracking application supposed to have several features such as tracking location, trigger, and notification alert [1].

Mobile tracker is focusing on tracking device which can locate the device, collect the SIM Card information, collect contact information, and call log information. These features are developing under the concept to track down lost phone [2]. Both research before are able to collect the location of the user in the realtime whether using Global Positioning System or Location Based System. These systems suggested on previous research are lack of several feature such as do not store the history location, not be able to take different kinds of evidence (such as photo and sound), and trigger by related of victims.

In this research, a new product is developed. The user which is in victim position is having control of this application. This application will record location of the user in specific time range which defined by the user, collect sound record in secret, and taking photo from every camera of the user's phone in secret. Whenever the user click the panic button, the application will send the notification to their relatives and family member which is already registered in that application by the user. Also, this will trigger a notification to the local security and send the evidences to the server. The evidences are location, sound, and photo recorded secretly on the user's phone and will be taking repeatedly in specific time range. The application also stores the location of the user's phone since the application is activated. So, the local security could be

able to respond quickly and accurately according to the data given. There are several applications which are available in google play store such as GPS Tracker, Track Any Phone, and Friend Locator: Phone Tracker. The comparison as shown in Table 1:

Table 1. Comparison Table of Family Locator, iLocateMobile, and Friend Locator.

Features	Family Locator- GPS Tracker	Track Any Phone (iLocateMobile)	Friend Locator: Phone Tracker
Route assistance	Yes	No	No
Tracking location	Yes	Yes	Yes
Emergency alert	Yes	No	Yes
Manage emergency contact	Yes	Yes	Yes
Messaging	Yes	No	Yes
History location	No	Yes	No
Sound recording	No	No	No
Photo taking	No	No	No
Manage crime status	No	No	No
Dual interface (for user and admin)	No	No	No

2. Research Method

2.1. Location Based Services

Location Based Services (LBS) is a service provider that provides location information. LBS is a value-added service from cellular services provider to collect location information of the user. To collect the location, this service will collect information from the device of the user that send back the signal from the tower and mapping it into the map to get the location. Even though this service is provided by the cellular services provider, but the accuracy is quite lower than GPS (Global Positioning System) which is depending on satellite to get the location [3].

2.2. Global Positioning System

Global Positioning System (GPS) is a feature that embedded to a tool that can send and receive the signal from the satellite to collect the exact location of the user. Nowadays, GPS is already attached to all smartphones that makes smartphone able to locate its own location. Because of this feature send signals from the device to the satellite then the location is more accurate rather than LBS [4].

Using GPS, position of user will be able to be tracked by the longitude and latitude of the user. Different transmitter having different accuracy. GPS on mobile device are having several kinds of GPS transmitter which affecting the accuracy of the user position. The transmitter been used on this research is A-GPS using Samsung Galaxy Tab 4. User's device has a configuration to upload user location for every specific interval time which is configure by user. But, when incident is already triggered the device will change the status and send the location with photo of front and back camera together with sound recording on phone.

In mobile phone, GPS works by transmit the signal to the satellites. The satellites receive the signal and monitor the position by control station which are sent back the signals through the satellites using ground antenna. The radio signals from satellites are pick up by GPS receiver on mobile phone [7]. In order to used google maps API, GSM is needed. GPS will focusing on collecting location while GSM will send the location which are longitude and latitude to Google Maps API to display the maps [8].

2.3. Questionnaire

Questionnaire is one of the tool to acquire information by giving the constraint and problem of the research on questions and collecting the feedback from the respondents as the answer of that problem given [6]. To be able to collect the right information, the questionnaire must be having principal requirement which are sequenced in a logical order, allowing a smooth transition from on topic to the next. By applying these principal methods, participant should be able to understand the purpose of research and able to give useful information [6].

3. Results and Analysis

In this section, the picture of the web application is shows. The result of this research is android application and web application which are consists of many pages including main page in android where user can access the panic button and trigger to the incident page on admin in web application. On web application, admin can also track down the location which shown in maps with the time range also can collect any other evidence in the real time. User can set the configuration of range time to upload location in normally, but when incident happen the system will collect the location per minute. Figure 1 shows Incident List's Page on web application where admin can see all the incidents happen. Figure 2 shows android main page where user can easily press the panic button which change the status on the server and collecting the evidence such as location periodically. Figure 3 shows the detail victims movement location in maps since that day. Figure 4 shows the evidence page which already collected also on this page admin can collect evidence such as photo from back and front camera and sound evidence.

From 30 Respondents, below are the description of the feedback.

1. How fast you understand and remember how to use this application?
 - a. 20 Respondents response "Very Fast".
 - b. 9 Respondents response "Fast".
 - c. 1 Respondents response "Slow".
2. How good are you using this application?
 - a. 20 Respondents response "Very Good".
 - b. 10 Respondents response "Good".
3. Is this application can fulfil your expectation about the problem?
 - a. 5 Respondents Strongly Agree.
 - b. 16 Respondents Agree.
 - c. 9 Respondents Neutral.

On the appendix, diagram of the process when the incident happen and collecting evidence will be shown.

No	Victim Name	Victim ID	Incidents Date	Incident Description	Status	Action
1	jesi	67	2017-01-10 02:40:48	Hilang saat pulang dari Universitas Sinar	L	Track
2	michael njaya	73	2017-01-10 19:23:31		L	Track
3	mm	71	2017-01-12 03:32:50		L	Track
4	mm	71	2017-01-12 14:51:41		L	Track
5	mm	71	2017-01-12 14:48:58		L	Track
6	mba	72	2017-01-12 14:37:03		L	Track
7	mba	72	2017-01-12 14:35:20		L	Track
8	mba	72	2017-01-12 14:29:08		L	Track
9	dmg	70	2017-01-10 06:32:08		L	Track
10	jesi	67	2017-01-07 13:26:10		L	Track
11	manglar	66	2017-01-07 12:27:48		L	Track

Figure 1. "List of incidents" page in web application



Figure 2. Homescreen on android application

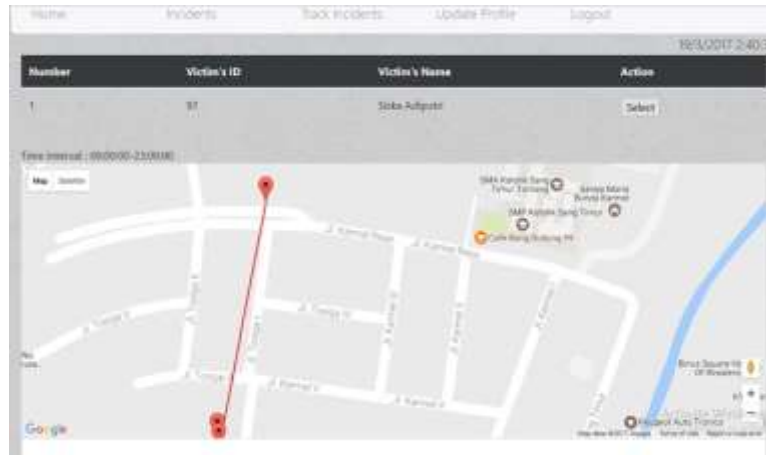


Figure 3. Incident's page on web application

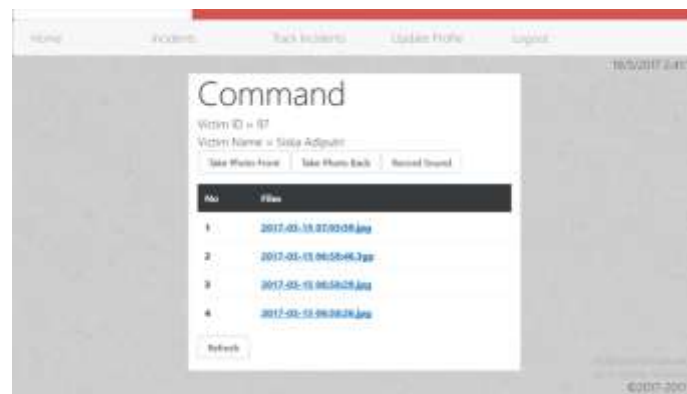


Figure 4. Evidence's page on web application

4. Conclusion

According to the result application and questionnaire given, this product has an easy and simple user interface. Also, this product can fulfill and solved the problem where the trigger control is also located not only on admin control but also in user. This application can collect different kinds of evidences such as photo, sound, and location which is not provide by other applications.

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Appendix

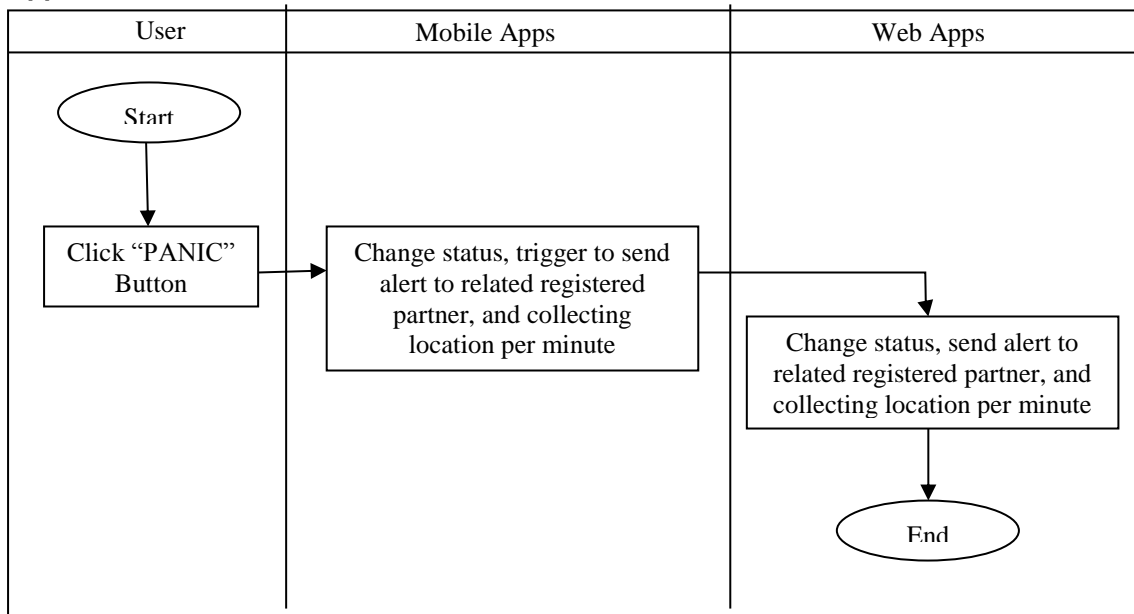


Diagram 1. Process of when incident happen

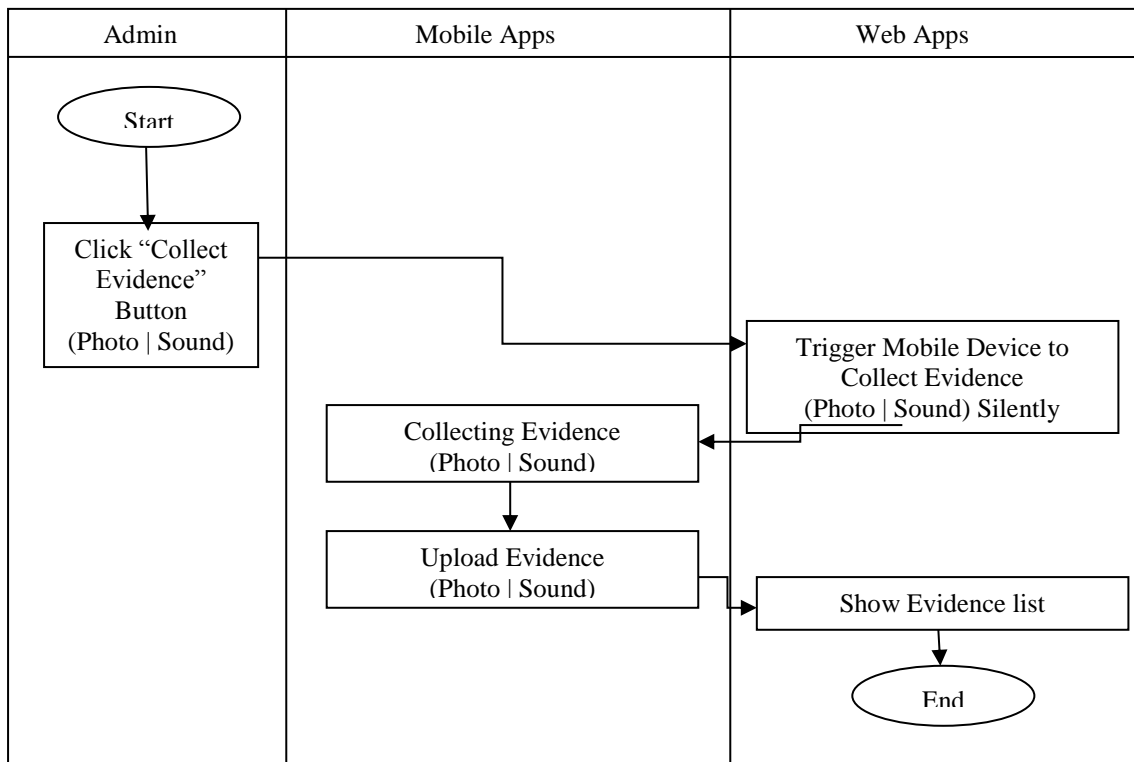


Diagram 2. Process of collecting evidence