

# A Mobile App to Automatically Detect and Report Children's Location

Chaluemwut Noyunsan, Pattarawit Polpinit, Pongsakorn Namsorn,  
Kanda Runapongsa Saikew

Department of Computer Engineering, Faculty of Engineering  
Khon Kaen University, Khon Kaen, Thailand

[chaluemwut@hotmail.com](mailto:chaluemwut@hotmail.com), [polpinit@kku.ac.th](mailto:polpinit@kku.ac.th), [somkaw@gmail.com](mailto:somkaw@gmail.com), [krunapon@kku.ac.th](mailto:krunapon@kku.ac.th)

**Abstract**—All parents are concerned about their children and often wondered their children's whereabouts. This paper proposes a mobile app and a web app that can help parents track their children's location. The parents can set an area and time such that the application send a notification to inform the parent of their children's location once they are out of the designated area. In addition, the web application allows parents to add and remove tracking devices, as well as, to check the history of registered devices in order to track and monitor children's locations.

**Keywords**—mobile application, children safety, location based

## I. INTRODUCTION

In today's unsafe world, most parents would be concerned when their children are out of the house whether they would wander off to inappropriate and unsafe places which could eventually lead to dangers such as go missing or are kidnapped. Therefore it is imperative to be able to track children location. In addition, most parents and children carry a smart phone. Thailand has 90 million mobile subscriptions among its 66 million people. The smartphone penetration rate is 36 percent, up 17 percent from last year [1].

Thus this paper proposes an Android app along with the web app that can help parents monitor where the children are.

## II. RELATED WORK

Many mobile applications have been developed in order to keep children safe. Some of the notable applications are Sygic Family [2], Life360 [3], MamaBear [4], WAY GPS Tracker [5], and Family GPS Tracker [6]. All the applications use GPS for real-time tracking. In Sygic Family and Life360 children can send a notification message to their parents.

Children can check-in to let their parents know their location in Sygic Family and MamaBear. Finally, Sygic Family allows parents to set area of which notification will be sent when children enter and exit the area.

Our app combines three important features which are 1) warning when the target is out of the specified area 2) taking the picture at the time set in advance, and 3) sending SMS to parents or children about their latest locations.

## III. DESIGN AND DEVELOPMENT

The system design is shown in Figure 1.

**Parent configuration system:** This part defines the area of warnings if children go out of the area. When using the app for the first time, the user needs to set up password. Parents can define the area by clicking at a map as shown in Figure 2a. After defining the area the system shows the screen for setting as shown in Figure 2b.

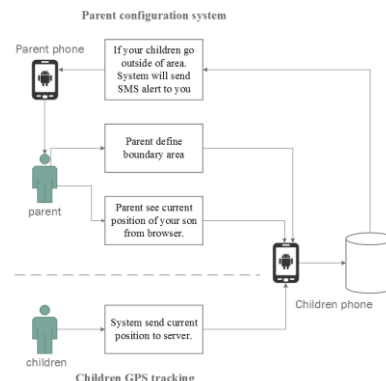


Fig. 1. Conceptual system design and development.

Parents will fill his/her phone number for the system to send SMS to them when children go outside

of the area. The system can define the time for taking picture automatically from the phone camera of the student.

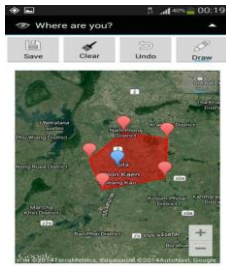


Fig. 2a. Defining the area boundary.



Fig. 2b. Screen for tracking setting.

After defining area and setting the warning the parent can click GetID for getting a code.

**Children GPS Tracking:** Children's phone apps will send the current position to the server every 30 minutes. If children go outside of the area, the system will send SMS to the parent's phone as shown Figure 3a. The system can take a picture automatically from a camera phone of the children as shown in Figure 3b.

#### IV. EXPERIMENTAL ANALYSIS

An Android app can be download freely at <https://play.google.com/store/apps/details?id=com.kku.way> and the web app is available at <http://www.socialdatacomputing.com:8080/tracker/>

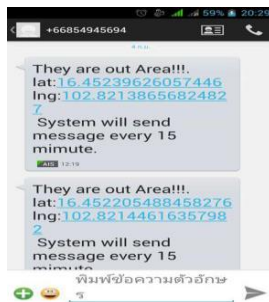


Fig. 3a. Sent SMS message.



Fig. 3b. Sent picture.

The system can send SMS warning messages to parents when children go outside of the school. Furthermore, the system can also take pictures from the camera of the children phone. The system can define the area of tracking position. Parents can use the web application for viewing the current position of children.

This paper assesses the effectiveness of the system by using real users. Users download the proposed app from Google play store and users can see a link of the questionnaire in the app description. After using the

app, users can give feedback and evaluate the app via the provided questions. The questions are as following.

1. This app is benefit for students.
2. This app is benefit for parents.
3. You can understand this app.
4. This app has a problem or a bug.
5. This app has an error or incorrect information.
6. You always use this app.
7. You always can track children positions via this app.
8. This app is completely functional.

Answer of questioner is rated from 1 (poor) to 5 (excellent)

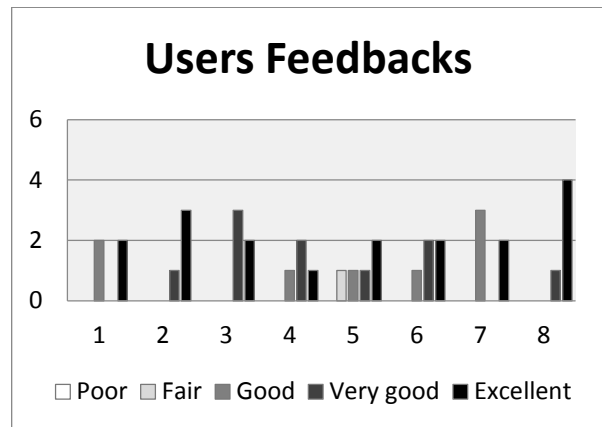


Fig. 4. Users feedbacks.

Figure 4 shows the questionnaire from five users. For all questions, users rate the level of "excellent" as 48.65%, the level of "very good" as 27.03%, the level of "good" as 21.62%, the level of "fair" as 2.70%, and the level of "poor" as 0%. From Figure 4, the graph shows that the question #3 and the question #7 receive other ratings more than the level of "excellent" Thus, it can be analyzed that users cannot understand the app and users may not be able to track children positions via this app.

Thus, we should improve UI/UX design of this app so that it is easier and more user- friendly.

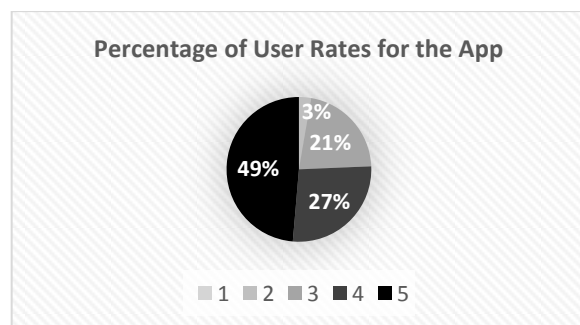


Fig. 5. Percentage of user rates for the app.

Figure 5 displays percentage of user rates for the app. This figure indicates that most users are satisfied with the proposed app because users rate this app as excellent and very good more than 76%.

## V. CONCLUSIONS

We have proposed two apps which are used together. They are an Android application and a web application. The Android application is for sending SMS warning messages when children go out of the specified area. The web application reports the current position of the children.

Based on current user ratings, we have found out that we should improve UI/UX design so that users can have more satisfying experience with the apps. In addition we would like to collect more user feedbacks and ratings.

In the future, we plan to integrate the system with Google calendar so that parents can receive notification about where children are via SMS sent free by Google calendar system.

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