Development of Location API for Tracking Continuous Non-Response Calls

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Extended Abstract

In every year, the occurrence number of children, the disabled people and the dementia patients' disappearance has been increased. Statistics data of Korea National Police Agency show that, in comparison with average one between 2006 to 2008, the number of missing people is significantly increased from 18,681 to 33,142 in 2009 and was even marked 41,836 people in 2010 – 2012. Children are the most portion of the missing people, dementia patients and disabled people are followed. To solve this significant issue, it is the most important to find the location of missing people as soon as possible.

Recently, as many kinds of smart device such as smart phone, tablet have been suggested, a lot of research about location-tracking using GPS sensor of smart devices have been studied (A. Al-Mazloum et al. 2013, Kim & Lee 2013). And a lot of applications related with the location tracking for children's safety such as "Famy", "ZoeMob Family Tracker", "Tutu Bell" is being provided through Google play store and Apple App store. These location-tracking applications for the disappearance of protected persons can be categorized in two in accordance with feature of each application, "Active" and "Passive". The features of active applications is to send their family the status message of protected persons automatically and to share the location of whom should be cared with protectors periodically. In contrast, the features of passive applications is that not the applications but the protected persons can decide whether they will send their protectors their own location information or not by various interface such as gesture or actions. Most notable technical features of these applications are continuous and real time tracking and transmission of location message by short message service (SMS), social network service (SNS) and messengers. But the applications have some problems and considerations.

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These tracking systems can cause a lot of problems in various aspects. In respect of hardware, battery of mobile device can be ran out by consistent operation of GPS and in the case of applications which can personally inform current location, the disconnection of internet network can be also considerable problem in emergency situation. And if we think of indoor situation, GPS has numerous error in the circumstance so supplement means are needed. Finally, in ethical aspect, continuous monitoring by mobile applications can cause the privacy issue.

To solve these problems, in this study, location tracking application programming interface (API) to implement the system which can transmit protected persons' location information to their protectors through SMS is developed.

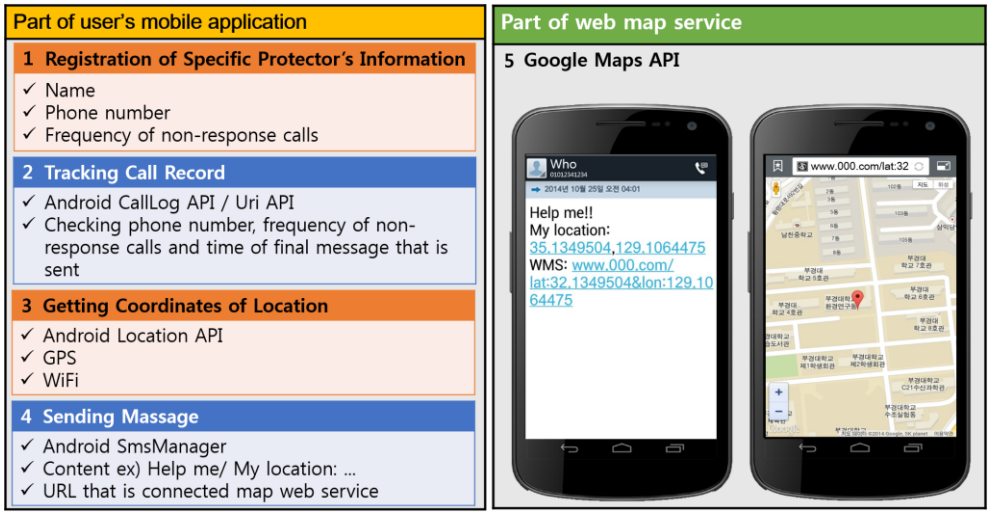

Figure 1. System Flow

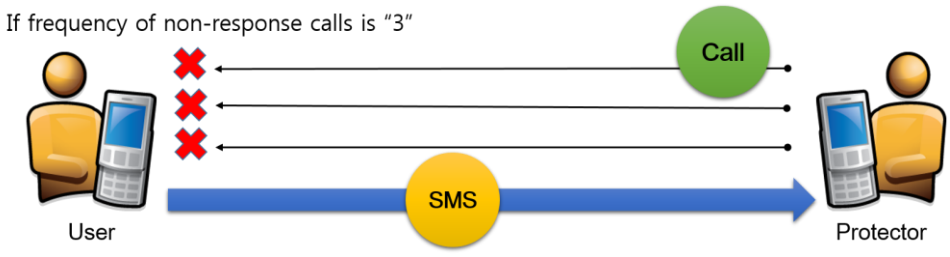

Figure 2. Concept of Application

Conceptual process and structure of application can be explained by figure 1 and figure 2. API can be divided into web and mobile application parts and main functions to trace the clients' location information is operated in mobile application part. In aspect of mobile, Protectors can register their attributes such as phone number and the frequency of missed call before using the application, and this attributes can be used as a trigger in the situation in which application should deliver the location information to protectors. When the frequency of missed calls reaches or exceeds preset attribute, users' location information is sent to protectors by using SMS independent from internet network. For example, as depicted in figure 2, if protector defined preset number as 3 and protected person didn't respond to protector's call as much as preset number, location description message can be sent to protector. In aspect of web server, Web Map Service (WMS) is adopted as interface for indicating provider's location information. If protectors received the protected person's location through SMS, they can click URL defined by the tracking application and location information included in URL parameter can be marked on map service of web server. As a result of these endeavor, mentioned problems in previous sentence can be solved.

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