Blood Donation Notification System by SMS and GPS on Android Platform

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Summary
Blood is a saver of all existing lives in case of emergency needs. Blood donation is one of the most significant contributions that a person can make towards the society. The blood donation events need a proper and systematic management. This paper aims to develop an android application for android operating system (OS) platform that automatically send the current address location of the user to the server database and can also be sent message through SMS (short message services) to admins. The result found that the system can alert the need for blood donors via smartphone. The evaluation of the system specialist and users has found satisfaction the system as a whole at a high level.

Keywords:
Blood Donor; Android Application, Classification, Short Message Services (SMS)

1. Introduction

Blood Donation are crucial for saving people's lives. The percentage of people donating blood is increasing day by day due to awareness to donate blood for those needed. To find prospective donors in a critical situation would consume a lot of time, where any delay may cause loss of lives. At the present time, the source of donated blood is a combination of involuntary donors (relatives, friends, and workmates), and some voluntary non-remunerated donors usually through campaigns. Smartphones have a wide variety of business uses that can save you time, help you keep in touch with customers and coworkers. The smartphone, which goes beyond the basics of calling and texting available on cell phones, is transforming the way we communicate with each other and record our lives. The mobile application is developed using technologies such as Global Positioning System, Google Application Programming Interface and Android platform. The Global Positioning System (GPS) provides satellite tracking services that are useful in a wide range of commercial and personal applications. Using GPS in business can carry distinct benefits leading to competitive advantages, although not every business type can benefit in the same ways [1] In various papers to use GPS for location tracking and routing. To utilize social media and smartphone applications to make the blood donation process more convenient, offer additional services, and create communities around blood donation centers. [2]

Based on the proposed idea a total solution to develop application for android system is established. Now a day, more and more people use smart phone. Besides making phone calls, nearly all smartphones today can natively provide directions through GPS. SMS (short message service) is a text messaging service component of most telephone, internet, and mobile-device systems.[4] It uses standardized communication protocols to enable mobile devices to exchange short text messages [5]

2. Theoretical Consideration

2.1 Map

Google Maps boasts more than 1 billion active users today, making it the most popular navigation software in the world. It gets millions of us where we need to go every day. Most of us are familiar with the Google Maps Navigation (in Fig. 1) feature that offers voice-guided, turn-by-turn directions, but did you know that there's a nifty shortcut to start it? You can search for a place or touch it on the map, then touch and hold the blue *Directions* button at the bottom right, and Google Maps will choose the best route and launch straight into Navigation mode [6]. Location of mobile device is in the form of latitude and longitude which is converted into full address by this application that includes country/state, city, and street number.
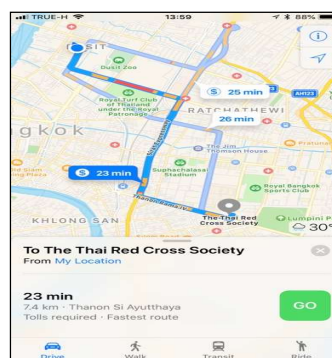

Fig. 1: Google Map

In this paper a GPS-based android mobile application is designed for notification. The application track down location of the user phone in the form of Latitude and Longitude the sent it to server database.

2.2 Android Application

Android is a mobile operating system developed by Google (in Fig. 2), based on a modified version of the Linux kernel and other open source software and designed primarily for touchscreen mobile devices such as smartphones and tablets. In addition, Google has further developed Android TV for televisions, Android Auto for cars, and Wear OS for wrist watches, each with a specialized user interface. Variants of Android are also used on game consoles, digital cameras, PCs and other electronics [7].

Fig. 2: Android Application [8]

The android application development process including: (in Fig. 3) [8].

1. Conceptualization – the initial analysis must include the demographics, behavior patterns, and goals of the buyer personal.
2. Feasibility Assessment – to assess the concept of the application is technically feasible or not, the app developers need access to public data through public APIs sourcing.
3. Design – the UX (user experience) designer architects the design element's interaction, while the UI (user interface) designer builds the app's personal. Application designing is a multi-step process for drawing clear visual directions and offering an abstract of the final product.
4. Development - the development progresses from core functionality development to light testing and for further field testing the concept. The creation process gets divided into smaller modules and the entire mobile app development process is applicable for each of these small parts.

5. Testing & Deployment – to test at early stages, often for usability, interface & security checks, stress, compatibility, and performance. After fixing the bugs, the app moves to the deployment phase and is ready for release via a formal launch.

Fig. 3: The application development process [8].

To summary of Step for Android app development process First, setup stage, to install Android SDK, android development tools and android platform. To create android Virtual Devices and hardware devices for testing. Second, design stage, defining the app requirement along with feature list, business case and target audience. Creating design and getting the assets cuts from the designer for targeted resolution [8].

2.3 SMS

SMS (short message service) (in Fig. 4) is a text messaging service component of most telephone, internet, and mobile-device systems. It uses standardized communication protocols to enable mobile devices to exchange short text messages. An intermediary service can facilitate a text-to-voice conversion to be sent to landlines. SMS was the most widely used data application, with an estimated 3.5 billion active users, or about 80% of all mobile subscribers, at the end of 2010 [9].
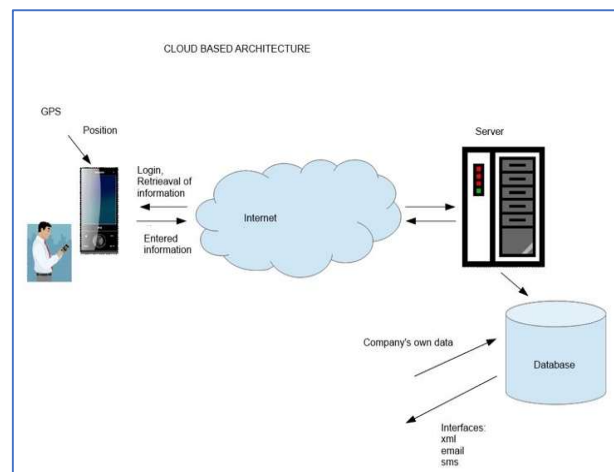

Fig. 4: Framework of Blood Donation Notification Application.

The figure (Fig. 5) shows the block diagram of android application that tracks the current location address of the user using GPS and sent it to server.
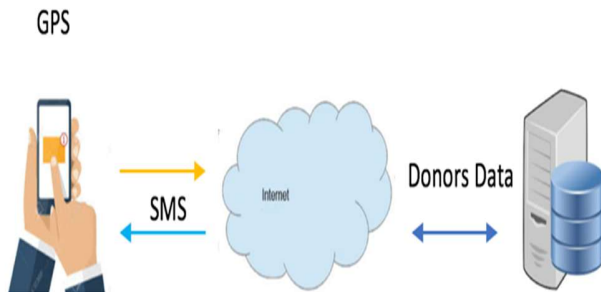

Fig. 5 : Diagram of android application

3. Experimental Consideration

3.1 Simulation Experiment

Table 1: Overall satisfaction

Item	Average	Std.	Meaning
Meets requirements	4.267	0.279	very satisfied
Accuracy	4.333	0.000	very satisfied
Design and Ease	3.952	0.126	very satisfied
Performance	4.000	0.000	very satisfied
Security	3.800	0.1826	very satisfied
Average	**4.0704**	**0.223**	very satisfied

Table 1 revealed that overall satisfaction with experts in the system at a high level. Average of 4.0704 standard deviation equal to 0.223. Topics for expert assessment of satisfaction is the highest accuracy. The average satisfaction was 4.267 and the standard deviation of 0.279 Title assessment experts were satisfied with the minimum-security system. The average satisfaction at the 3.800 standard deviation of 0.1826.

Table 2. evaluation results that satisfied the users of the system.

Item	Average	Std.	Meaning
- Satisfaction in the performance	3.986	0.112	very satisfied
- Satisfaction presentation style	3.984	0.087	very satisfied
- Satisfaction with useful applications	3.989	0.129	very satisfied
Average	**3.99**	**0.0140**	very satisfied

System performance assessment results by the users from the users' number 246 people, trial systems and then store the information satisfaction in use.   Table 2 presents the results of an assessment of overall users. Find satisfaction in the system as a whole. The average score was 3.99, standard deviation of 0.0140 assessment of satisfaction in the performance of the system. Users are satisfied. With an average of 3.986 standard deviation equal to 0.112 users are satisfied with the presentation. With an average of 3.984 standard deviation equal to 0.087 and users are satisfied with the benefits of use. With an average of 3.989 standard deviation equal to 0.129.

3.2 Blood Donation Notification System

Research to develop a notification system needs blood to study the effectiveness of public relations activities affecting blood donation. To develop a database system to store information about blood donors. The system can alert the need for blood donors via smartphone. The system can provide information about blood donation. Before the blood donation procedure. The population of this research is a person aged 18 or over both the donor and the donor never before. Want to encourage people to donate blood increased. The research found that:

1. Alert system needs the blood can store information about the blood donor. The system can alert blood donor needs to pass a smartphone. The system can provide information on places to get blood donation. Practice before and after the healthy public relations news Providing general information related to blood donation to members.
2. Evaluation of the system specialist has found satisfaction   in the system as a whole at a high level. Average of 4.0704 standard deviation equal to 0.223 for the topic of the experts were satisfied with the highest accuracy. The average satisfaction was 4.267 and the standard deviation of 0.279 Title assessment experts were satisfied with the minimum-security system. The average satisfaction at the 3.800 standard deviation of 0.1826.
3. Evaluation system of user satisfaction with the use of found that, overall, users satisfied in use. The system is in high level. The means of 3.99 standard deviation equal to 0.0140 results to evaluate the satisfaction in check. Working system of user satisfaction with the average value of 3.986 standard deviation equal to 0.112 users. Satisfaction in the presentation, with the average value of 3.984 standard deviation equal to 0.087 and users have. Satisfied to use the average of the 3.989 standard deviation equal to 0.129.

4. Conclusion

The development of the notification system of need on the Android operating system, which is a popular operating system used. Currently it is increased to meet the needs of the development function system developer and users as well. Therefore. The system can alert blood donor needs to pass a smartphone. The system can provide information on places to get blood donation. Practice before and after the healthy as well as effective. Alert system needs blood is a system developed to collect data members with a desire to blood donation. The system can send a message to those who want to donate blood transfusion requirement via smart phone, so it can. Having such a system applied to alert other styles. The result found that the system can alert the need for blood donors via smartphone. The evaluation of the system specialist and users has found satisfaction the system as a whole at a high level.

As a future work, this application can be developed for different platform like IOS.

Acknowledgment

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