Help Me Please!: Designing and Developing Application for Emergencies

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Abstract. Help Me Please! Application is an android platform emergency button application that is designed to transmit emergency messages to target receivers with real time information. The purpose of developing this application is to help people to notify any emergency circumstances via Short Message Service (SMS) in android platform. The application will receive the current location from Global Positioning System (GPS), will obtain the current time from the mobile device and send this information to the receivers when user presses the emergency button. Simultaneously, the application will keep sending the emergency alerts to receivers and will update to database based on the time interval set by user until user stop the function. Object-oriented Software Development model is employed to guide the development of this application with the knowledge of Java language and Android Studio. In conclusion, this application plays an important role in rescuing process when emergency circumstances happen. The rescue process will become more effective by notifying the emergency circumstances and send the current location of user to others in the early hours.

1. Introduction

An emergency situation is any sudden and unexpected circumstances that may cause an immediate risk to a person’s health, life, property or environment. Emergency according to Oxford Pocket Dictionary [3], is a term that describes a state which related to a managerial term, demanding decision and follow-up in terms of extra-ordinary measures. Moreover, a state of emergency demands to be declared or imposed by somebody in authority and it implies rules of engagement and an exit strategy [6].

Most emergency circumstances require urgent intervention to prevent a worsening of the situation. Rescuing a person can prevent a worsening of the emergency circumstances. However, rescuing process becomes difficult when the rescue party cannot get any information about the circumstances such as the current location of the person. This circumstance makes the rescue party used more time to find out the current location of the person and delay the rescue process. There are some emergency circumstances which keeps changing the location such as kidnap. In this case, the updating real-time information is important to a rescues process, it makes the rescue process become easier. Thus, this paper describes an android-platform emergency button application named Help Me Please! is designed
to transmit the emergency message to the target receivers with the real-time information when an emergency circumstances happens.

This application enables the user to send emergency alerts with current information to others quickly and efficiently. With this application, the rescue process becomes more efficient, the user can notify others and send the current information of the user to others to get help from another faster when the user in trouble. At the same time, this application can keep updating the current information to receivers and database until user deactivates the send out emergency alerts function. The remainder of this paper is organized as follows. Section 2 presents related works within the field of emergency notification using mobile technologies. Section 3 presents the methodology of the project. Section 4 presents the requirement analysis and design of the application. Section 5 discusses the works, and finally Section 6 concludes the project.

2. Related Work
An emergency situation is any circumstances while sudden and unexpected that may cause an immediate risk to a person’s health, life, property or environment. Most emergencies require urgent intervention to prevent a worsening of the circumstances. Van de Walle and Turoff [5] state that emergency circumstances can be either manmade, intentional, or accidental. Especially hard to plan for is the rare and violent twist of nature, such as Sumatra-Andaman earthquake of 26 December 2004, with an undersea epicentre off the west coast of Sumatra, Indonesia, triggering a series of devastating tsunamis that spread throughout the Indian Ocean, killing approximately 230,000 people. Hui-Nee [2] state that in the year of 2011, investigated accidents involving loss of life is about 7% or 176 cases out of 2,429 cases in Malaysia. It shows that they are many accidents happen in Malaysia and the accident considered as an emergency circumstances.

Bolin and Westlund [1] agree that mobile devices such as small portable laptops and mobile phones thus constitute an important personal communication tool in everyday lives of ordinary people. The mobile phone is a device that can make and receive telephone calls over a radio link while moving around a wide geographic area. At the same time, it also contains several methods to contact other users with the mobile phone such as call, send and receive Short Message Service (SMS) and others. Based on of this all contact methods, the mobile phone is a suitable device to notify any emergency circumstances to others.

Singh and Kaur [4] state that Android is an open-source platform of Google for mobile Devices consisting of an operating system. Google provide many services to Android such as search, email, calendar, browser, navigation and others. At the same time, Android is flexible, it can run properly on different screen sizes and forums attract many developers choose to develop the application in android-based. Based on the reason above, android platform is a suitable mobile phone platform to develop a notification system.

With the rapid development in the wireless and mobile techniques, it is important to accurately seek out the current position of the moving object such as the victims. Such information can be very helpful when an emergency situation happens. To date, many applications have been developed in notifying any emergency circumstances [7][8][9]. However, some of the applications need login and password in order to use the applications. Moreover, some applications are not capable of updating important information to the database after activated the send alerts functions.

Summing up, all this apps have been helpful for users in helping them notifying any emergency circumstances to others. This initiates the development of Help Me Please! Application with intention to help people in sending emergency messages to their intended receivers.

3. Development Approach
Help Me Please! Application is developed by using Object-Oriented Software Development (OOSD) method since the application is developed as a mobile application using object-oriented programming. Object-oriented development is a partial-lifecycle software development method in which the decomposition of a system is based upon the concept of an object. This method is fundamentally

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different from traditional functional approaches to design and serves to help manage the complexity of massive software-intensive systems.

Requirements analysis is implemented to look for the application’s needs and its functionalities. At the same time, Unified Modeling Language (UML) is used to design the functional and non-functional requirements including the classifications of classes, relationship, objects, attributes and behaviors of objects. These elements can show the flow of the events and activities of the Help Me Please! application. The user interface of Help Me Please! application is also expected in designing phase to ensure the usability of the system. Both results and outcomes from object-oriented analysis and design phases are carries as the fundamental of the Help Me Please! application to the next level of development phase which is the implementation phase.

Table 1 shows the user requirements for Help Me Please! application. First, the user should be able to input the personal information which included name and phone number. Second, the user should be able to input or edit the emergency message. First and second requirements give the user to input the required information into the application and send that information to the target receivers when emergency. Third, the user should be able to choose the target of send out the emergency alerts. This is important because the user can choose the person who can help him/her when emergency. Fourth, the user should be able to set the time interval of keep sending out the emergency alerts. This requirement can make the user keep sending out the emergency alerts based on the time interval setting set by the user. Fifth, the user should be able to send out emergency alerts with current information when emergency, that information is helpful to the rescue process. Sixth, user should be able to view the current location of himself / herself so the user can know where is he/she now when emergency. Lastly, the user should be able to cancel the send out emergency alerts function when safe or active by mistake, so that user does not send the wrong message to the receivers.

Table 1. User Requirements for Help Me Please! Application

- User should be able to input the personal information which included name and phone number.
- User should be able to input or edit the emergency message.
- User should be able to choose the target of send out the emergency alerts.
- User should be able to set the time interval of keep sending out the emergency alerts.
- User should be able to send out emergency alerts with current information when emergency.
- User should be able to view the current location of himself / herself.
- User should be able to cancel the send out emergency alerts function when safe or active by mistake.

4. Requirement Analysis and Design
Help Me Please! application framework and object classes are structured and planned carefully to ensure that it always adhere the outlined requirement specifications.
Figure 1. Use Case Diagram of Help Me Please! Application

Requirements analysis is important in order to establish user and system requirements. Analysis on the requirements produced the project specifications document to develop the application. Use Case diagram will be derived from the analysis results. Figure 1 depicts the entity involved in managing application which is the user.

To create intuitive and user friendly interface, aspects like layout, navigations, color schemes, and forms elements were planned carefully. In the application development, we values functional design, minimalist design and flat design in order to provide the user with simple yet rich with user experience.

5. Result and Discussion

5.1. Application Development

The main artefact for this project is the development of the application. Help Me Please! Application is developed based on the application requirement specifications. Figure 2 below shows main interfaces for the application. User is allowed to manage the setting based on their need in setting page. User can choose either enable or disable the send via SMS method and set the time interval for sending alert. When the switch is clicked, a notification is displayed to inform user that SMS function is either switching on or switch off at the moment.
Figure 2. Main interfaces for Help Me Please! Application

Figure 3. Setting Page For Managing Time Interval

Figure 3 shows the setting page for managing the time interval. They are six choices in this drop-down list menu, including 30 sec, 1 minute, 5 minutes, 10 minutes and 15 minutes.
User is allowed to view the current location of them through the map. Google Map API has been implemented to show the map. Figure 4 shows the map page for display current location of user.

![Map Page For Displaying Current Location Of User](image)

**Figure 4.** Map Page For Displaying Current Location Of User

The application will send out the emergency alerts with current information of user to the target receivers when the emergency button in the first page is pressed. At the same time, it keeps sending out the emergency alerts repeatedly with a fixed time interval set by user as shows as Figure 4 until deactivate the send out emergency alerts function. Figure 5 shows the first page when function activate and send out the emergency alerts to receiver 1 successfully.
Figure 5. Page when function is activated and send out the emergency alerts to receiver 1 successfully.

Figure 6 shows the two emergency messages received by the receiver when the time interval setting is 1 minute. It shows the current time of first message is 18:46:05 and the second message is 18:47:09. The time interval between these two messages is around 1 minute.

Figure 6. Two emergency messages received by the receiver when the time interval setting is 1 minute.
Figure 7 shows the two current information records updated into database when the time interval setting is 1 minute. It shows the current time of first record is 18:46:05 and the second record is 18:47:09. The time interval between these two records is around 1 minute.

| Hour | 0165442352 | Help!! | 27-05-2016 | 18.46.05 | 1.86565594 | 103.11658461 | Parit Raja | 56% |
|------|-------------|--------|------------|----------|------------|---------------|-----------|-----|
| 30   | 0165442352  | Help!! | 27-05-2016 | 18.47.09 | 1.86565609 | 103.11658443 | Parit Raja | 56% |

**Figure 7.** Two current information records updated into database when the time interval setting is 1 minute

6. **Conclusion and Future Work**

Help Me Please! Application is hoped to provide users a medium to inform the emergency circumstances to others in android application. One of the advantages of this application is it automatically sends out alerts with current information of user to others. In additional, the application is Android-based which is easy to use and can be applied by users at anytime and anywhere with requiring an internet connection. Besides that, current information of the users in help will be updated constantly to database after emergency alerts function is activated. Overall, Help Me Please! application has achieved the objective to be a well function application that help user during emergency state. Though, there is still some room for improvement in making this application a success. In the future, offline map is suggested to be implemented into this application in order to view location without the Internet service.

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