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# Emergency calling Application for Android Platform: An Overview

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**ABSTRACT:** Android is an operating system for mobiles which is based on the Linux kernel and currently developed by Google. Android is full featured and lightweight. Most of the Android applications are written in Java-like language that can be ported to new platform easily thereby adopting huge number of useful mobile applications. This paper elaborates the enhanced functionality of the emergency call for android. This is an application that you activate before you might get into an emergency situation i.e. before walking alone through a tunnel. Then you have to press a button or a finger on the screen. As soon as you lift the finger from that button/screen, the device will send an emergency call or message to a friends, family, police, and doctors and send the exact current position. As soon as they know the position of user they can reply to the rest of people.

**KEYWORDS:** Android, GPS, Location Position, SMS, Call.

### I. INTRODUCTION

Over the past two decades, the proliferation of mobile devices has extended the possibilities for developing mobile apps that effectively assist users in multiple daily activities. A condition that helped the community as a whole was the greater availability of emergency calls, as it became available on any mobile phone. However, some people still have trouble making an emergency call because of disabilities or traumas. One obvious case is that of the deaf, who can not communicate by a voice call. Other examples are the ones of elderly people with some illness or sudden critical situation which makes it difficult to articulate words (such as riots, hostages, smoke inhalation or any vocal disease) or even the case of shock/panic situations under violent occurrences. According to the 2011 World Disability Report, the number of people with disabilities in the world is currently estimated at one billion, about 15 per cent of the current world population. This report's preface states that Disabled people experience barriers that many of us have long taken for granted in accessing services[...] ». The same report shows that 124.2 million people worldwide have hearing loss, equivalent to about 2 per cent of the world's population, about half of them over 60 years of age.

Now a days security of women at the night and at times even in a day when travelling alone anywhere is a concern. Various terrible crimes have been occurring in the different parts of the country. New Delhi, the capital of India is a big eyewitness of such a crime. Along that when any person travel longer distance from the home in unknown areas, their security is an important concern also. It has been observed that the instance communication of message of one's locations precisely is a problem. This paper describes Emergency Call system developed in Android platform. The individuality of this application separately from other application available is that the user needs not waste time navigating inside the phone menu i.e. to unlock the screen, to initiate the service. Instead of this they can directly press or touch the button and thus sending the location of that user in terms of latitude and longitude. The location will be send to the preregistered phone numbers in the application. There are many such applications available in the market which sends a custom message to the number registered but not the location of that person also these applications are not able to send message again and again after some interval of time. But in this newly proposed and verified application the longitude and latitude information which gives the universal idea of the place of the current position of the mobile user is attached with the custom message that had been originally set in the application. And then this information is conveyed to the phone numbers which is registered already. So thus this newly featured application supports to find the exact location of the person in need also it will be so beneficial in tracing the location of occurrence easily at latter time.



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## II. LITERATURE SURVEY

Considering worldwide emergency reporting systems regardless of their wired or wireless communication method, we mainly researched some specific device parameters. Mobile devices (cell phones) of a day are now indispensable and inseparable parts of the common man to contact each other via call or text. In many different sectors, smart phones are used, such as industry, education, social networks, environmental monitoring, safety and transport. Another interesting mobile app called HelpMe which deals with the disaster environment. It introduces new approach to building the ad-hoc network using Wi-Fi to enable smart phones to communicate during times of disaster. It operates without the support of any network of telephone providers, and smartly hop-to-hop-based message forwarding. It also chooses to use routing algorithms to forward the message. It has HelpMe server centralized to record all of the emergency incidents until service is restored.

The paper [1] proposes a voice keyword recognizing app to recognize the user and activate the app functionality even when the mobile keypad locked. The GPS module tracks the longitude and latitude to trace an exact location of a user and sends the pre-stored emergency message including location to the registered contact numbers. The Audio Recording module starts the recording of the conversation for five minutes and stored as evidences. The message goes in queue if network problem and send when network gets available. A notification is generated for successful deliver message. Also user can select contact through voice based contact list and make a call. Note: The spoken keyword converted into a text to compare with the registered keyword.

The paper [2] proposes an emergency response situation recognizing app called as IPROB to provide women safety even in the situation like terrorist attacks or natural disaster, by just shaking the mobile above the predefined threshold value automatically activate the system. It starts capturing the surrounding voice to test and confirm the unsafe IPROB situation where it raised the notification and user fail to respond in predefine time then the message alert sends to the register contacts. If the mobile profile at the receiver is in silent mode then convert it into the General profile to give the voice notification as “YOUR CHILD IS IN TROUBLE PLZ HELP...PLZ HELP ...” continuously like a ring tone, until they stop it. If a register contact confirms a PROB then appropriate emergency services like ambulance, fire brigade are alerted. If a register contact responds with an audible notification, then it automatically connects and enables the speakerphone at the victim side. An integrated tri-axial accelerometer used to evaluate the unique movements that a phone experiences as threshold.

The paper [3] proposes a SCIWARS app (Spy Camera Identification and Women Attack Rescue System) which consist of two modules. A first module act as an intelligent alerts system which detects the infrared rays coming from every Night-vision hidden cameras placed in changing room/hotels room etc and also informed the user about unsafe place through message. Now it's the user responsibility whether to register a complaint or not by forwarding the notification with the location to legal authorities such as Police. The second module will get activated by pressing any key continuously which will provide the help to the victim from physic attack in unsafe situation. It sends the emergency message containing location to register contacts. It also records the voice and captures the images of the surrounding for 45 seconds. This information also stored in secret location of mobile for future evidences. This app also able to converts the receiver mobile profile from silent to general mode, and also supports the auto-call receiving system at victim side.

The paper [4] proposes an android app to provide security at two different situations as follows. The First module provide security to Women at Emergency Situations propose a Save Our Souls (SOS) app to provides the security on a single click of SOS button for the women travelling at night or alone. No need to unlock the screen, instead by just pressing the power button it directly triggers the application to run at the background, to send the emergency message including the location in the form of latitude and longitude to the registered contacts. The second module proposes an android based home security system that provides security of house belongings and Senior Citizen in the user absence. Since the security of senior citizen is always a concern with increasing number of robbery incidents. This app informs the user about an attempt of intrusion activity at home through a message and a feedback SMS triggers an alarm in the house. The minimum requirement is the android mobile, a hardware circuit embedded with a switch and GSM modem



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that are connected to the door. When an intruder tries to open the door, the switch triggers an interrupt for the microcontroller to activate the GSM modem to send warning SMS to the store registered number in the modem. At the receivers end the application pop up the menu frequently for user attention. If the user fails to acknowledge in the defined time interval, then the automatic positive acknowledgement message get send to the remote GSM modem which in turn interrupt the microcontroller for an alarm.

The paper [5] proposes an app, in which a single click of SOS sends a message containing the location and/ or audio-video call to the guardian number. At receiver touch the location URL in the message to view it in the Google Map. It also provides different help tools like First-Aid help, Fake Call Help and video call. The First-Aid help tool provides the help on various health issue problems occurred at an accidental or emergency situation during the night time. First aid help for various problems are as: unconscious and not breathing, choking, bleeding heavily, burns, heart attack, diabetes etc. The Fake call help to escape from the meetings- parties at a time when women start feeling uncomfortable and think that, "if someone calls me then I can leave this place". Fake call rings tone same as that of normal incoming call ring and once call accepted it stop ringing. It also supports Fake Hang Up option. The guardian contacts are by-default for this app, but it able to search the cops, firemen, hospitals contacts nearby to your location. It also sends the audio-video recording via Email-Gmail of emergency situation taken by the user where user unable to speak or tell the circumstances.

The IEEE real project [6] propose an automated highly reliable women security device which consist of the advanced sensors embedded in a wearable dresses. It consist of advanced sensors, GSM and ATMEGA8 microcontroller with ARDUINO tool which keep user under observation at all the time. It monitors the heart beat-rate, temperature and vibration in body through sensors to check for uneasy situation. In such situation it will activate the GPS module to track the location and wireless camera to capture the images that get send to the control room of the receiver through GSM modules to take necessary actions. At the same time processor activate the mice unit with amplifier which strengthens the voice of the women to screams or shout above the threshold limit.

The Paper [7] proposed a portable device as a belt which is automatically activated base on the pressure difference crosses over the threshold in unsafe situation. A GPS module track the location and sends the emergency messages to three emergency contacts every two minutes with updated location through GSM. The system also activates the screaming alarm that uses a siren, to call out for help and also generates an electric shock to harm the attacker for self-defense which may help the victim to escape. The device mainly consists of micro controller on the ATMEGA328 board which programmed using the ARDUINO programming language.

The paper [8] proposes the women security device called as "Suraksha" which is an easy to operate device. This device can be activated through- voice command, Press a switch key and shock (i.e. when the device is thrown with force, a force sensor used to activate the device). In emergency situation it will send the message including instant location to the police, via the transmitter module and registered numbers via a GSM module. Currently the work is under process to embed it in jewelries, mobile or other carrier like belt etc. It can play a major role in the propose projects where all the police stations are connected and share the criminal records, crime investigating cases etc.

The paper [9] proposes an extended vehicle tracking system to track the vehicle based on GPS with that it also provides the safety through an emergency button kept under the vehicle seat using GSM. As the increasing economic growth rate of a country, many companies are establishing their setup in the nearby region of the cities. Since, the security of women employees' inside the private transportation is the companies' responsibility.



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## III. SYSTEM DESIGN

### Architecture Diagram

1. Three iterative evaluation phases were defined:

**Generic user's evaluation phase :** Users with special need evaluation phase; – Operational evaluation phase.

### Development process

The definition of the phases took into account the objectives of evaluation in line with the specified requirements and the methodology. The different iteration have specific objectives , a in a top-down approach, starting with the generic requirements and specializing them according to the needs of each identified group. A concrete accessible problem was selected: deaf citizens. Choosing a concrete problem allowed to gather the main requirements for the application and perform refinements and generalizations that could guide to a universal and accessible solution. These refinements were made according to the needs and possibilities of application usage by other citizens, such as, people with restricted movement, the elderly and people without special needs, but in momentary panic. Moreover, usual problems associated with emergency calls systems, such as false calls and emergency location, were taken into consideration for the system requirements.

## ADVANTAGES OF SYSTEM

### Uniqueness

In the existing systems, we have mentioned many Android applications having similar feature to my application. In all those applications, victim's location is sent only once to the registered contacts in different forms like SMS, EMAIL etc. But in practical situations, the victim may not be kept at one place standing, she may be moving around. So, in all those applications, we can know only one location immediately after the start of the application, but practically after sometime she may not be present at that place. The unique feature of my application is location is sent continuously for every five minutes till "STOP" button in the application is pressed. So, even if the Human is made to move around in the city, because of this feature of continuous location tracking, she can be rescued quickly and safely. Also, one of the contacts will be receiving a call, sometimes there may be chance for people not seeing the SMS, but after receiving the call they get alert and can look at the SMS and can identify that their near ones is in danger quickly.

## IV. RESULT AND DISCUSSION

The following figures are the screen shots of Emergency calling application initially from the starting of it. Fig 2 represents screen shot of the application immediately after opening the Emergency calling app on the root device (device on which the application is installed). It contains four contact numbers to be filled of which first phone number receives call and SMS, the other three phone numbers receive only SMS. Also, the layout contains three buttons "Save Config", "Close App" and "Start" buttons. After filling the phone numbers, "Save Config" button must be clicked such that all those contact numbers will be saved in the Emergency calling application and these given phone numbers are called Registered Phone numbers.

## V. IMPLEMENTATION PROCESS

The following figures are the screen shots of Emergency calling application initially from the starting of it. Figure represents screen shot of the application immediately after opening the Emergency calling app on the root device (device on which the application is installed). It contains four contact numbers to be filled of which first phone number receives call and SMS, the other three phone numbers receive only SMS. Also, the layout contains three



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buttons “Save Config”, “Close App” and “Start” buttons. After filling the phone numbers, “Save Config” button must be clicked such that all those contact numbers will be saved in the Emergency calling application and these given phone numbers are called Registered Phone numbers.

This paper presented a prototype of a mobile application, named SOSPhone that enables making emergency calls without audio communication, by selecting icons in a touchscreen mobile device. This application has potential to be particularly important for deaf and elder people, as well as in situations of panic or some other sudden incident that makes it difficult to articulate speech. The development process, following a design science approach, included 3 phases of evaluation that gathered information on the usage of the application by more than 100 users. These evaluation phases included quantitative tests with over 100 beta testers that enabled collecting preliminary information that was important for refining the application, and also proved the validity of our approach, which is seen as very promising by all users. Qualitative information was also collected with interviews with health professionals, emergency and security services, civil protection and deaf people, informing the development process to accommodate adequately all emergency situations, maintaining at least the same level of service that is possible to regular users of emergency phone calls. Presently, quantitative tests with a large number of deaf users are being planned with a deaf association, in order to have the ultimate feedback from the users that can benefit more from the SOSPhone application. Another important issue is the availability of the application for the major mobile OS platforms (currently it is implemented for Windows Phone and Android based mobile devices, but it is also planned for iPhone, Blackberry and Symbian platforms).

The prototype was implemented with the aim of proving the validity of this approach to accessibility in emergency calls. Currently, the application is being redesigned to incorporate operational requirements for its integration with the Portuguese emergency services. Further extensive tests will be needed to validate the application in a production scenario, which includes testing thoroughly the recognisability of all the icons in the interface. We are also accommodating several suggestions received from various sources, such as the inclusion of a tutorial video before the activation of the application, to familiarize users with the available features and required interactivity.

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