

SHESecure SAFETY APP – THE HEXA UMBILICAL CORD

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ABSTRACT

The violence against women is increasing tremendously. With a specific thought, many kinds of violence against women such as sexual assault, rape, and domestic violence. It is often unreported due to social norms, sensitive issues, etc. Nowadays lack of security issues are there, one of the main issues is women security. In this modern world violence against women becomes even more difficult to capture. Also, more issues have been identified in late response. The crime against women is happening beyond the thinking of the common people. So, this paper proposes the development of an Android application called “She Secure Safely App – The Hexa Umbilical Cord” that ensures the various security features to prevent from various victims, the main motto of this app is to prevent women in strange situations. It does not require internet connections except for any features. The contacts are registered through network providers. In case of emergency this application is used to trace the location of the user and the contacts of the nearby police stations using GPRS, video and audio can be recorded for 10 seconds and then forwarded to registered contacts.

Keywords—Women Security, Android, Save Our Soul (SOS), Application, Video, Surveillance.

I. INTRODUCTION

The crime rate against women are increasing every day, therefore it is essential to take several steps to safeguard them from those criminal activities. Several steps have been taken to protect women kind and the easiest way to provide services to them immediately is through their handheld devices. The mobile device is the only help they can seek for help in an emergency. Therefore, providing different services through their mobile devices is a very good idea which may help them to save themselves from the opponent. Keeping this in mind, several Android apps have been developed recently. Referring to all those apps and with an idea to overcome their flaws and to provide a more user-friendly application, this app has been proposed. The unique features in this app will help the user in different situations and therefore it is considered as more user-friendly and more secured.

This is a smartphone app that helps women to ensure their safety using their own handheld devices (android mobile). Women are often viewed as a victim of the conflict. The best way to minimize the chances of becoming a victim of violent crime (robbery, sexual assault, rape, domestic violence) is to identify and call on resources to help the women out of dangerous situations. Global security resolution act 1325 is passed for giving peace to women and for making the right decision. On being response women also take such prevention steps to be secured. This app will initiate various features such as messages to registered contacts, siren sound, flashlight, a call to a nearby police station, location identification, audio and video recording for 10 seconds which is sent to registered email contacts. By using these features in this app, it is easy to reduce the violence against the women.

If the users are in immediate trouble or being separated from friends during night time and don't know how to get home, having this app on their handheld devices can reduce the risk and bring assistance whenever needed.

II. RELATED WORK

A. Women Safety Help TOTEM SOS (Firoze Zia Hussain - 12/11/2014)

The app has two main features, one is sending a text message and the other one is to produce the siren sound. It sends messages to the registered contacts when the message button is clicked and it also produces a loud siren sound when the other button i.e., the siren button is clicked [5].

B. Safetipin (Safetipin – 28/08/2014)

The app gives the user a map based view of a locality, a city or the world along with its safety score. You can set up circles of interest and get knowledge about threats of harassment or general precautions that should be taken. The main disadvantage of this app is that it has only very few features that are not considered as useful to its users [3].

C. Women Security App (Sky Developers Inc. – 19/06/2014)

This app will record a video along with the sound for 45 seconds. It will also send an alert message to one of the registered contacts. One of the main disadvantages of this app is that it provides only less features and it is not considered as user friendly [8].

D. Telltail (DIMTS Ltd. – 07/06/2014)

A creation of DIMTS (Delhi Integrated Multimodal Transit System Ltd.), the application allows the user to be tracked through the GPS on their phone or the vehicle. The user can send instant alerts to a chosen group of contacts as well. The app lets your location be known even if there is no GPS on your cell phone as a location can be monitored using the vehicle's GPS. The main disadvantage of this app is that it requires internet connection to identify the user's location [10].

E. Women's Security (Appsofindia – 17/12/2013)

Most security applications offer a distress message service. What makes Women's Security different is that you can record a 45 second voice recording which is sent without your active interaction. If you are in a no-reception range, the app sends the message as soon as a signal is available. This app provides only fewer features which is noted as a disadvantage of this app [14].

F. Women guard VithU (Zayan – 17/12/2013)

The app has two features such as sending text messages and to send the recorded sound to the registered

email. The messaging feature sends messages to the registered contacts and the other feature records sound and send that recorded clip to the registered email contacts [9].

G. *Bsafe (Bipper Inc. –08/11/2011)*

The app's motto is "Never Walk Alone". The app lets you create a net of 'Guardians' who will receive your SOS message. In the free version, the designated guardian can also be called. The SOS message also includes your location via GPS. You can also enable the GPS tracker and let your friends know location at any time. This app provides only less features in the free version and it requires internet connection that makes this app a less reliable one [2].

III. SCOPE OF THE PROPOSED WORK

The main aim of this app is to provide all basic and best features to women which will help them in different situations. It gives six different features that will provide six different helps in various situations. It will be user friendly and it can be easily accessed. It is very much reliable and flexible. The facilities provided by this app will surely ensure the safety of the women.

This android application is designed mainly to ensure the safety of women in emergency situations. The main feature of this application is that it does not require any internet connection. The application will be opened by double clicking the power button and it comprises of six options which provides six different features. The first option will be an ice option used in case of emergency. This will help the user to send alert messages to five contacts along with their location. On clicking the second option, it will make a call to the nearest police station at regular intervals. The third option is used to produce a siren sound from the user's phone. From many articles, it was found out that the main reason behind those rape cases was sound. So, if a sudden sound is heard that too a siren sound of a police vehicle, the attacker will definitely get distracted, so this feature will definitely help the user to save herself from the attacker until someone comes to save her. The fourth option will switch on the flash light which will definitely help her while running in the dark. The next option is used by the user to know her current location if the place is unknown to her and the final option will open the mobile camera and starts recording the video for 10 seconds and then the video will be forwarded to the registered email contacts. This feature requires an internet connection.

IV. PROPOSED WORK AND ITS ARCHITECTURE

This paper proposes a new mobile application which ensures the women's safety under various situations with the help of six different functions. This application provides an easy access to the users and it doesn't need any internet connection to use its features. This application provides facilities such as

- To send an emergency message to five different contacts (registered contacts)
- To make an outgoing call to the nearby police stations
- To know the user's location
- To produce sound (police siren)

- To switch on the flashlight.
- To record a video for 10 seconds and send it to the registered emails (requires internet connection).

This app introduces a new feature which identifies the location of smartphone users from the specific network providers without using internet connection.

Figure 1 gives the architecture of the proposed application. The Android app makes use of the network provider's services as well as the internet in order to make use of the several features provided in this app. The messaging and the call feature use the network provider's services while the video feature makes use of the internet. A database is maintained to store the inspector's number of different locations therefore when the call feature is used; it will automatically come into the database in order to identify the phone number and immediately triggers a call to the respective police station.

The other features are not using internet connections and services of the network providers, instead they use the features that are available within the handheld devices. The flashlight and the phone speakers are the services that are available by default with the mobile devices.

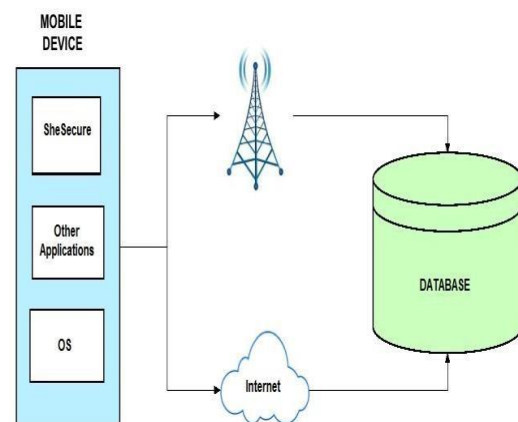


Fig. 1. Proposed Architecture

V. IMPLEMENTATION OF PROPOSED WORK

A. Technologies Used

1) *Functional Requirement*: The requirements of the initial implementation and future updation are specified by functional requirements. This describes the accurate need of the user.

2) *Performance Requirement*: The project product perspective, overview of requirements, general constraints and user view of the application are described by performance requirements. Also, it provides the functional needs and specific requirements of the application. The functional needs of this application are interface, functionality and performance requirements.

3) *Software Requirement*: The purpose of the software requirement specification is to describe the necessary tools to build this application. This requirement includes an Android operating System, Java as a core language, Android SDK 2.3, SQLite as back end.

4) *Android SDK 2.3*: Android is an operating

system based on Linux with a Java programming interface [20]. The Android Software Development Kit (Android SDK) provides all necessary tools to develop Android applications. This includes a compiler, debugger and a device emulator, as well as its own virtual machine to run Android programs.

Android is primarily developed by Google. Android allows background processing, provides a rich user interface library, supports 2-D and 3-D graphics using the OpenGL libraries, access to the file system and provides an embedded SQLite database. Android application consists of different components which can be reused by other applications.

5) *Eclipse IDE*: Eclipse is a multi-language software development environment comprising an Integrated Development Environment (IDE) and an extensible plug-in system [21]. It is written mostly in Java. It can be used to develop applications in Java and by means of various plug-ins, other programming languages, including Ada, C, C++, COBOL, Perl, PHP, Python, Ruby, Scala, Clojure, Groovy and Scheme. Development environments include the Eclipse Java Development Tools (JDT) for Java.

The initial codebase originated from Visual Age. The Eclipse SDK (which includes the Java development tools) is meant for Java developers. Users can extend its abilities by installing plug-ins written for the Eclipse Platform.

6) *SQLite Database*: SQLite is an ACID-compliant embedded relational database management system contained in a small (~275 kB) C programming library [20]. SQLite implements most of the SQL standard, using a dynamic and weakly typed SQL syntax that does not guarantee the domain integrity. In contrast to other database management systems, SQLite is not a separate process that is accessed from the client application, but an integral part of the client application. SQLite reads operations can be multitasked, though writes can only be performed sequentially. The source code for SQLite is in the public domain. SQLite is a popular choice for local/client storage on web browsers. It has many bindings to programming languages. It is arguably the most widely deployed database engine, as it is used today by several widespread browsers, operating systems, and embedded systems, among others. SQLite is an open source embeddable database engine written in C by D. Richard Hipp. It is entirely self-contained with no external dependencies.

7) *Hardware Requirements*: This System is built on Intel Pentium 4 CPU, having clock speed of 3.0 GHz, with RAM size 512 MB, 40 GB of hard disk capacity, display is of 15-inch color monitor, and internet keyboard.

B. Phases of Implementation

Implementation of Women security application has several phases which are given below

- Message to Registered Contacts
- Call to Nearest Police Station
- Producing Police Siren Sound

- Switching on Flashlight
- Location Identification
- Audio and Video Recording
- App Integration



Fig. 2. Overview of the Proposed Application

Figure 2 describes the detailed functions and services provided by SheSecure Safety App. The six features and its uses are explained in detail in the figure.

1) *Message to Registered Contacts*: The user has to add five registered contacts along with the police helpline number to whom the messages will be sent in case of emergency. This phase makes use of the messaging service in the user's mobile in order to send the alert message to the contacts which are already registered. The same alert message along with the user's location will be sent to the registered contacts at the same time. The location is identified using the antenna of the network providers.

2) *Call to Nearest Police Station*: This function is mainly used to make a call to a nearby police station. The inspector's number of different locations is already stored in a database. When the call button in the app is clicked, it first identifies the user's current location and then search for the same location in the database and trigger a call to the number which is stored already in that location. The call will be made to a police officer based on the location which is very nearer to the user.

3) *Producing Police Siren Sound*: A police siren sound is produced in a loud volume. This feature is used mainly to distract the attention of the person on the other side. An audio clip of the police siren is already stored in the app. When the siren button is clicked the audio clipping of the police siren will be played and the main use of this module is that by hearing a police siren suddenly may distract the opponent and it will be very much useful to the user to run away from that location or to seek help from others or even to attack the opponent.

4) *Switching on Flashlight*: This feature is used to switch on the flashlight in the device (if available). This phase makes use of the flashlight in the user's device and when the flashlight button is clicked it immediately turns on the flashlight.

5) *Location Identification*: This feature is used to identify the location of the user. The location is

identified using the GPRS. The internet connection is not required to identify the location. If the current location of the user is not known to the user this module will help the user to identify their current location. After knowing their current location, they can alert their friends or relations about their exact current location.

6) *Audio and Video Recording*: This feature opens the camera and starts recording the video for 10 seconds and stores it directly to the phone. It also sends the recorded video to the registered email contacts. If the user wants to show the image of the person who tries to attack her to her close relations or friends this module will be very much useful. This phase makes use of the phone camera to record the videos for 10 seconds, therefore when this button is clicked the mobile device's camera will get opened immediately and starts recording the video automatically. Figure 3 illustrates the overview of Video Recording Process.

7) *App Integration*: These features are integrated in a single application. The application can be accessed by double- clicking the power button.

C. *Data Flow Diagram (DFD)*

Data Flow Diagrams are a graphical tool used to describe and analyze the movement of data through a system. DFD's are used to capture the essential feature of both existing system and future physical implementation of the system. The DFD is a graphical technique that depicts the information flow and the transforms that are applied to the data which are from the input to the output.

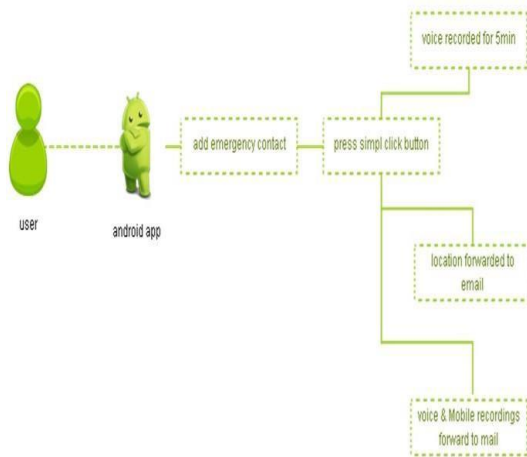


Fig. 3. Overview of Video Recording Process

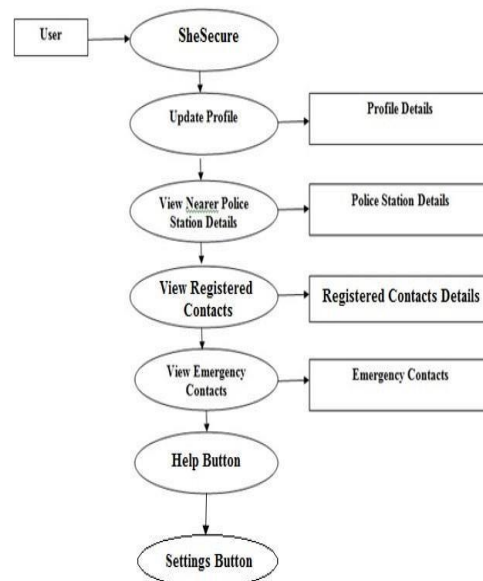


Fig. 4. DFD Level 0– Outline of the System Flow

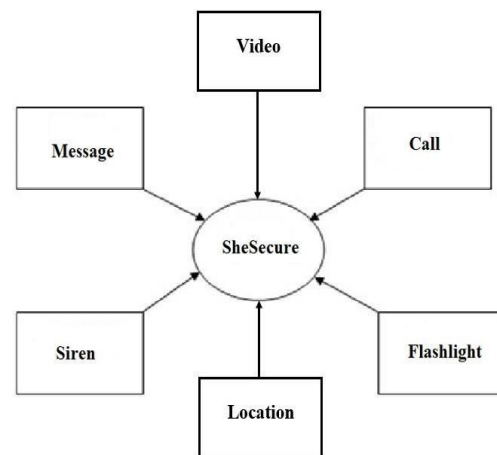


Fig. 5. DFD Level 1 – Differentiation of Frontend and Backend

Figure 4 illustrates Level 0 DFD of SheSecure Safety App. Level 0 Diagram is balanced with context diagram. It shows the difference between the input going into the process and the output coming out of the process. Data Stores are given importance at this level.

Figure 5 illustrates the context level DFD, mostly called Level 1 DFD. It is the most basic form of DFD. The main aim is to explain the working process of the entire system. There is only one process in the system and all the data flow either into or out of this process. It explains the interactions between the process and external entities. They do not contain Data Stores.

VI. RESULTS ANDDISCUSSIONS

SheSecure Safety App is implemented using Java 1.7 as its coding language. The toolkit that is being used to implement this app is Android 2.3 and the Eclipse is used as an IDE. The app is developed in such a way that it is compatible with all the versions of android including the current version Lollipop, making it possible for all the Android users to use it.

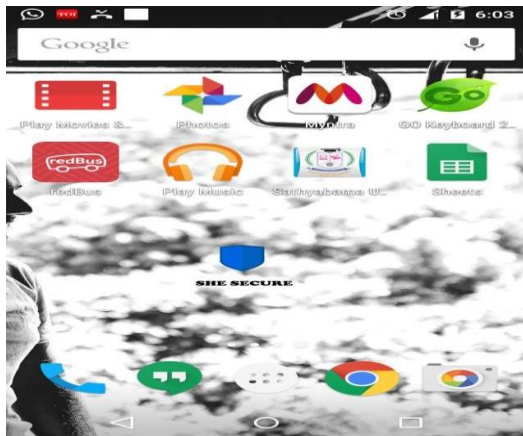


Fig. 6. Home Screen – SheSecure Widget

Figure 6 illustrates the general view of icons of various applications on an Android phone; our application has been named as SheSecure.

The above screenshot shows the icon of the SheSecure Safety App in an Android device. The icon of the SheSecure Safety App is a shield which indicates that it is an app that can be used as a shield to women when they are attacked by some strangers or any other emergency situation.

Figure 7 illustrates a graphical view of the developed application; it comes into view soon after clicking on SheSecure icon. This contains easily recognizable icons as illustrated in Figure 5; those are Message and Video icon, Call icon, Siren icon, Flashlight icon, Location icon, Register Button, Help Button and Setting Button.



Fig. 7. SheSecure Safety App Interface – Services provided by this App

The above screenshot shows the interface of the SheSecure Safety App which comprises of five buttons which provides six different features to its users and it also has a register button where the users store the contact numbers and emails of the individuals, from whom they need help in case of emergency. The first button will be used to send messages to the five registered contacts and to record a 10 second video which will be simultaneously sent to the registered email contacts. The second button will be used to make a call to the nearby police

station. The next button is the siren button which produces a loud police siren when it is clicked and the other button which is below the siren button is the flashlight button which is used to switch on the flashlight available in the handheld devices. The last button helped the user to find their exact location at that time.

The bottom left corner of the app has the help button which gives instructions about the app to its users and the other corner has the settings button where the user can change the settings of the app. These are the different buttons that are available in the app which provides an interface to interact with the app.

VII. CONCLUSION

VIII. This paper covers all the functions and services that are provided by SheSecure Safety App. The App will act like a security weapon for women to ensure their safety. This application works on any handheld devices with Android operating system. This application provides rich tools for sending messages to the predetermined contacts, making calls to the nearby police stations which automatically include the exact location of the user. The main advantage of this app is that it has six different features integrated in a single application. It doesn't need any internet connection to identify the user's location. It will ensure the safety of the women to a greater extent because of its six different features. Hence this application will survive long and surely reduces the maximum risk of becoming a victim. This app can be developed with some more features in the future and make it more user friendly.

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