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# Implementation of W-ALERT- An Application for Women's Safety

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**ABSTRACT:** Safety and Security of the women is our primary concern. In India and other countries, women's protection is becoming increasingly important. Since everybody in today's world has a smartphone, it can be used for a variety of purposes. For women's protection. The main issue is in handling the crime cases by police sometimes they didn't reach on time or some other problem. The constraints for these time distress is not knowing the perfect location of any women. We have to learn only one thing is how we can use smartphones for women's safety in the form of mobile applications. The Women Safety Application system offers the added protection of being tracked by relatives on different time intervals and different locations. In addition to this family, parents can easily track and monitor her daughter. Because every girl has a cellphone and seldom puts it down, the Women Safety Application was developed. Many families and practitioners are becoming aware of the numerous advantages that Women Safety Application provides.

**KEYWORDS:** Women Security, Android, Firebase, Authentication, Database.

## I. INTRODUCTION

"The treatment of women is the best barometer of a country's development". Abuse towards women is a huge problem in a society as well as violation of women's human rights. We all are living in the 21st century but still women's of our country along with the women's of other countries are not safe as in day time or a night time. As Stated by the National Crime Records Bureau's (NCRB) annual report for 2019, Thirty-two thousand and thirty-three violation and abuse cases were reported across the country, or it means 88 cases per day, down from 91 cases per day in 2018. According to a government-commissioned survey, more than 53% of children in India are sexually assaulted, but the majority of these assaults go unreported. 10 years ago, in the dark of December 16, 2012 the cruelty acquaintance rape of physiotherapist by six men on a bus and she died after the 2 weeks. Although 2 years ago on November 28, 2019 the gang rape and murder of a 26 years old veterinary doctor from Hyderabad by four men. This incident spread at national as well as at international level and it was the most humiliating thing that happened in our country. To overcome these types of situations in future I have developed an application which helps women to work till late nights and can freely enjoy their lives as they want. In grave situations women only have to click one button and the application will send their location directly to guardians and parents as well as to the nearby police stations. Application includes many more facilities from which women can stay safe at their respective places.

## II. LITERATURE SURVEY

1. Kamath et. al. implemented an WoSApp application that enables women safety in three different ways like input emergency calls, triggering the alarm, and transmission SOS messages to the local police station. This message consists of geographical location of the act and personal details of the women. According to me, this application can consist of many other features which can improve the security towards women. This application is lagging because of its User Interface and the options which are added to them. In hazardous situations women must have easy access to the applications. The upgrading plans of this application is to make a contract with project jagrati to link their application facilities.
2. Cardoso et. al. Stated that cyber based harassment and violence of threats against online women users. More than 75% of women in America have experienced online harassment and threats of physical abuse till sexual harm. Warning of intimate partner violence (IPV) via SMS and social media threatening of posting intimate photographs and videos. Technology can be used in both ways but considering technology in a righteous way is very helpful for women regarding their security of lives.

3. Kapadia et. al. proposed that the IoT i.e., Internet of things network which is capable of physical devices, electronics, software, sensors, actuators which enables to collect and exchange data. With the help of IoT they thought about the safety of women in such a way that women can wear a band on their wrist which helps them in hazardous situations. Tap 2 times on band and band will send their position in the form of latitude and longitude to the police station and if the abuser tries to remove that band with the help of force sensor will start ringing in the radius of 50m. This band will connect with the help of Bluetooth to women's smartphones and there is a huge chance it will reduce the rate of crime against women.
4. Sonawane et. al. projected that Safety of women has become a major concern for our nation. Women can't step out of their residence because of the fear from the abusers, rapists etc. In this paper I got the information regarding women safety with the help of voice recognition. Women will register in this application to allow all the permissions regarding the location, voice notes and many more. Then the system will collect all the voice notes with the help of microphone of women and send it to the database to store and in dangerous situations the system will recognize the collected voice if it will match to the voice which is stored in the system then it will send their location to the particular contacts saved. Therefore, this system will help women to rescue from unsafe conditions. As this idea seems to be nice but the minor issue is if the women's voice accidentally didn't match with the stored one in the database that will become more dangerous for the woman who is already in a panic situation. So with the voice recognition they can also give the alternate option as press the button 2 times and it will send the location.
5. Kalpana et. al. proposes smartphone applications which ensure women safety at night time especially. This research says that the effective way to minimize a chance to become a victim against violence is to call someone from their relatives. For this technique they created a system which includes six different features to help women without an internet connection. Features include sending emergency messages to five different contacts, calling nearby police stations, to know the user current location, to produce siren sounds, to switch on flashlight and to record a video for 10 seconds and send to their irrespective email address. They said that this application will come with more features in future to help women in the home or outside the home.
6. Kamte et. al. suggested that all the applications which are out there for women safety are not providing the safety information of the local streets from the women who are travelling to reach their particular houses. For this drawback they came forward with the system called Street smart which shows the information about the street on the basis of articles and reviews. If any woman came across the unknown street she had to hold her camera phone at the street and the system would show all the reviews and articles about the street on her phone from that information if the user wants then she can contact the police station or step aside from that street. Users can add their post and views about that street. This application will help them to save themselves from becoming a worst victim against these crimes. This application is mainly concerned about the information of streets but in addition to it they can have at least one more option as women came in contact with unknown streets and after she got the information regarding the street the application should send their location to the emergency contacts.
7. Yarrabothula et. al. mentioned that the strength of women compared to men. Physically, a woman is weaker than a man, particularly in comparison to men especially in an emergency situation. This application stated that they are different from the similar applications like in this in 4 ways. Firstly, women have to save four contacts of police, friends and family and click on the save button. Second of all while travelling women have to click on the start button whenever a need arises. As soon as the start button is pressed the application will call the first number saved on the database and send the location URL via SMS. Lastly, the most unique feature that they describe is SMS of location will be sent continuously after every five minutes till the stop button is pressed so that particular guardian can have current and updated location of women.
8. Sheikh et. al. Consider the safety concerns for all women which are working in the society. Some of the major safety factors are mental harassment and physical harassment. In an Organization or at the workplace any guy passes comments in a sexual way or passing dirty jokes to women comes under mental harassment. To ensure the women security this system proposed some methods which could be beneficial for the women at their workplace. Online complaint, Position detecting, scream alarm, Database, Voice recognition, Location tracking and Address finding module, Message sending module.
9. Tasneem et. al. projected that in the past years many researches have been done in the field of women security with the help of technology. This paper came with a device for women safety with raspberry pi and a raspberry camera module. This device includes Raspberry pi, Arduino Uno, GPS, GSM, etc. In the critical situation the rescue work starts itself from the band which is placed on the wrist. If the user clicks the wrist switch 2 times within five seconds

the location SMS will be sent to the police station and family. They designed an application to take all actions after the wrist switch is on called a CWS application. The future update of an application is camera and video recording option. To conclude, they said that this device will serve a protection to women against violence.

10. Deshmukh et. al. addressed that the Mumbai local areas which are more often dangerous for women to travel there. They stated as users should know which area is safe or which is unsafe for this, they created a system which tells them crime prediction of an area using the Geographical Information System (GIS). It uses many things such as Data source, Machine learning models, backend components, Map SDK. System has different FIRs in different formats stored in a database from which system will learn in which area how many cases are there with the help of Machine learning and it will predict the crime rate in that particular area.

### III. FLOWCHART

W-ALERT has many credentials options to sign up and login into an application. As this application consists of many other features like calling, camera for security, self-defense videos and send location. As it starts from the Splash Screen page then travels through different processes for login into the Home page. Firstly, a user has to Register himself/herself by simple Email Id and Password or Google Sign Up or Facebook Sign Up. After Registration user will redirect to the Login page where he/she has to enter their email id and password and click on Login. As a result, an application will allow the user to go into the Homepage where all the features are integrated like Calling option, Emergency Contacts, Camera, Send Location, Self-Defense Videos and many more.

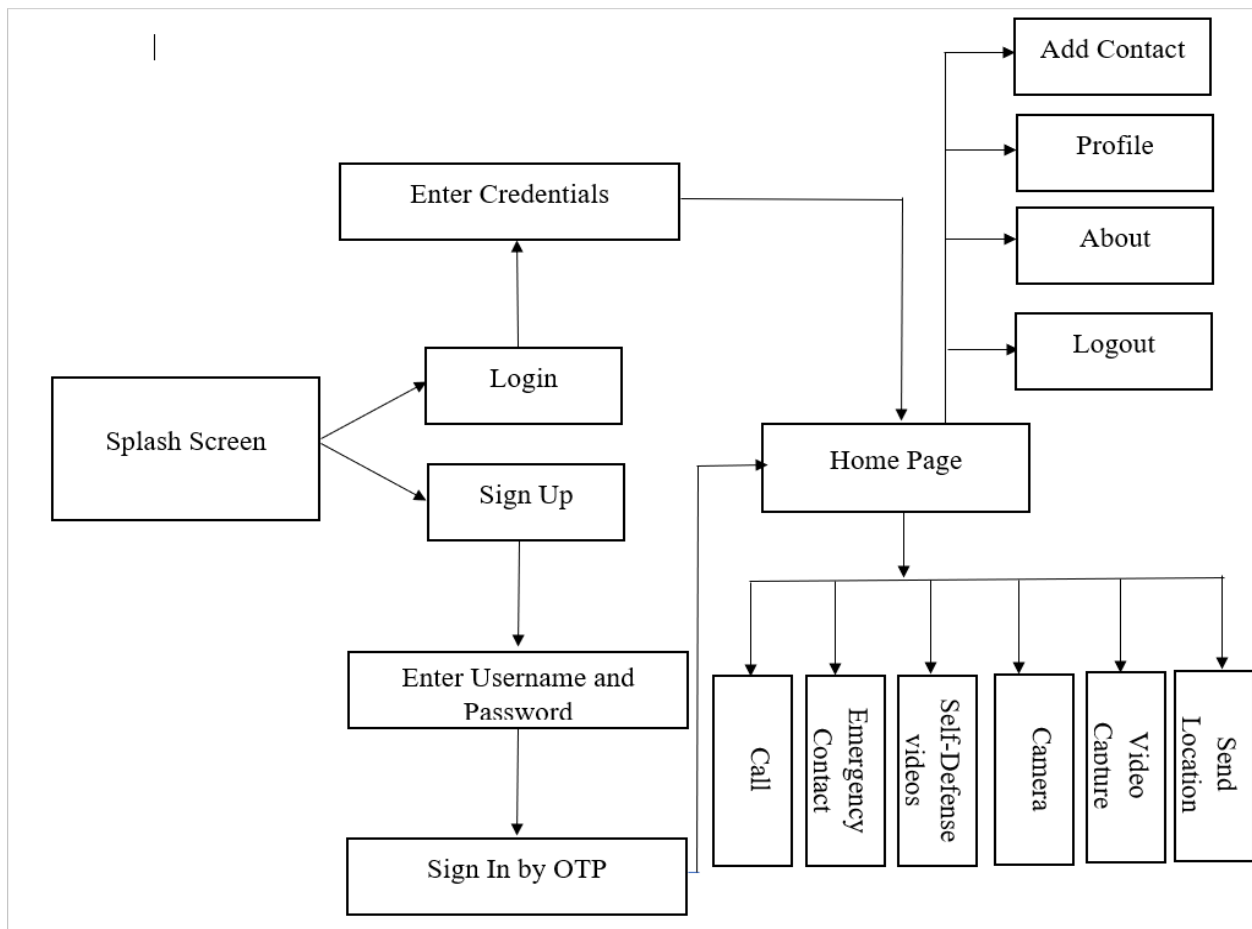


Fig 1.1 Flow Diagram for the application

#### IV. PROPOSED METHODOLOGY

In a Mobile application world, I have developed an app providing security for women. Sending location can help women in critical situations. As sending location is the biggest achievement for women safety but in addition to it many other alternatives or features are there for women in this application. In this system or an application woman can register themselves and can use many features like saving emergency contacts, calling them directly when they need, camera for dangerous situations, self-defense videos to teach them how to tackle the situation, voice call and video call features are also included.

##### 1. **Firestore Authentication for Google Signup, Facebook Sign Up and Otp Sign In**

Many applications need to know user identity. Knowing a user's identity application allows a safe and secure access and saves the data to the Realtime database and provides the same event to all the user's devices. I have used Firestore authentication for users to login into the application by its credentials. The user can sign in by using email id and password, Google Sign In, Facebook Sign In and one more option for the people who do not want to link their accounts to login into application i.e. Otp Sign In feature.

##### 2. **Firestore Data Storage Realtime Database Module**

With the help of NoSQL cloud storage, we can store and sync data. Data is synced in real time across all the clients and is usable even if the application is turned off. Firestore Realtime Database is hosted in a cloud. Data which is stored in a Realtime database is stored in the form of JSON format and sync across all linked clients. Users' data as in their name, email id, passwords, profile photos, addresses, mobile number, etc. are stored in a database table in firestore. Users can store as well as fetch their data for example, for the chat function in WhatsApp we have to allow our contacts to store in that application to chat with someone like this for storing contacts and fetch that contacts I have used firestore database.

##### 3. **Firestore Cloud Messaging for Chat Notifications**

Firestore cloud messaging or FCM is a service which allows us to send messages safely and securely at no cost. With the help of FCM we can send a notification to a client app that has new mail or other notification to sync. Application notification as in new updates, features, message all these things are sent on the head of the mobile phone with help of the firestore cloud notifications.

##### 4. **Fetch Contacts using RecyclerView with card view from Firestore**

RecyclerView is newer technology with more advanced features, more versatility and with a more flexible version of the list view. RecyclerView is identical to list view except recycler view forces the RecyclerView.ViewHolder class to hold the data which is not necessary in List View. Card View is a UI Component which shows the data inside the cards. Card View is generally used to show Contacts Components. Contacts which are stored in the firestore database will be visible in recycler view by means of the card view.

##### 5. **Storing & Retrieving Self-Defense Videos from Firestore**

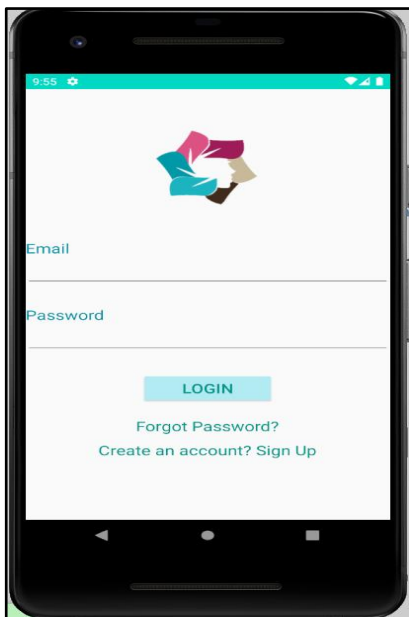
Videos which are very helpful for women to keep themselves safe from the people are stored in Firestore storage and fetched in self-defense videos activity with the help of RecyclerView and Card view. Videos will be played with the help of Exoplayer which is not part of the Android framework and is distributed separately from the Android SDK. Because ExoPlayer is a library, you can easily take advantage of new features as they become available by updating your app.

##### 6. **Send Location by using Google Maps SDK**

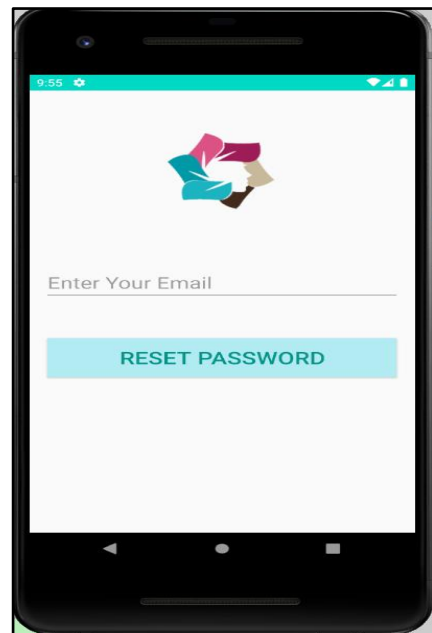
Sharing a user's location in a map view allows users to send their location with all the services in such a way that users can easily communicate with live interaction and share other geo information. Although because of Google Play Services Maps SDK, one can share a location in google maps without opening it or directly to that location in the Google Maps. Longitude and Latitude are sent after clicking on the Send Location button. After clicking on the button Location is sent to the contacts which are stored in emergency contacts.

### V. IMPLEMENTATION

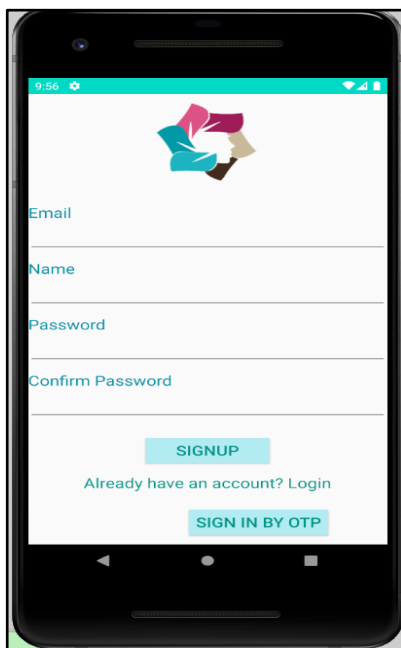
W-ALERT provides many functions and services which can help women for their safety purposes. This figure contains just a prototype of the application at last the icon, chats and self - defense video will consist of real time data which will be fetched from Firebase. From this application I am expecting the sending the users current location to the Emergency Contacts, users can do video call and voice call and also can do is chat with the contacts, users can capture the image of the betrayer, vehicle number, etc. and record the video for 10 seconds, users can call the police, ambulance and fire brigade directly from the application with the help of telephonic services, users can learn many techniques for defending themselves by seeing self-defense videos.



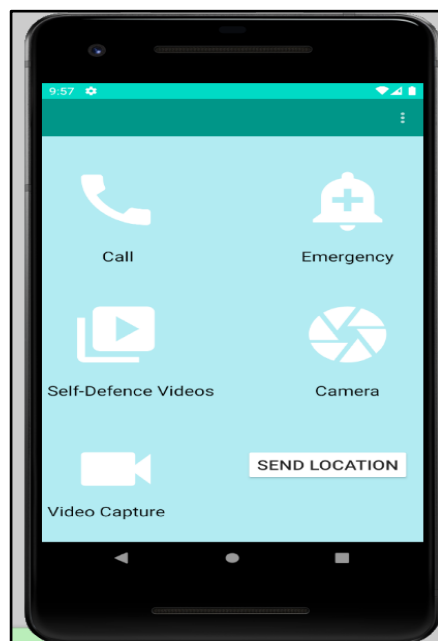
Screenshot 5.1 Login Screen



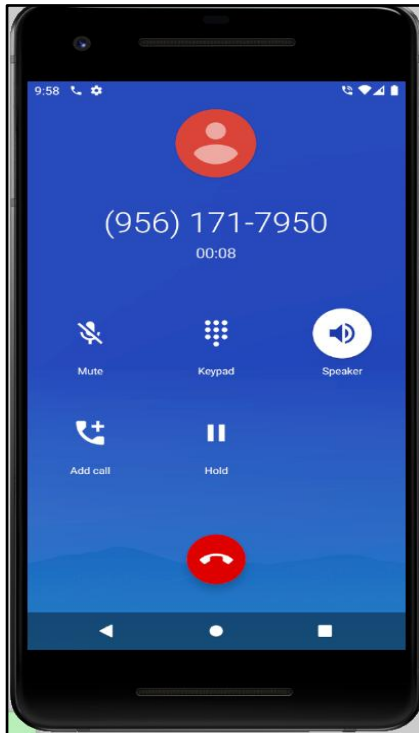
Screenshot 5.2 Reset Password



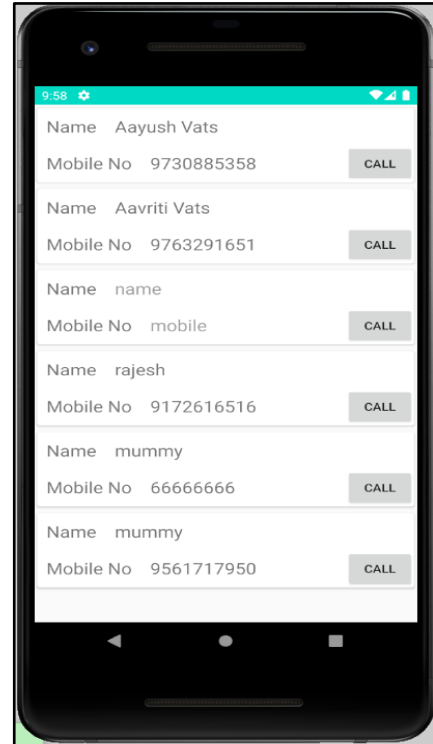
Screenshot 5.3 Sign Up Screen



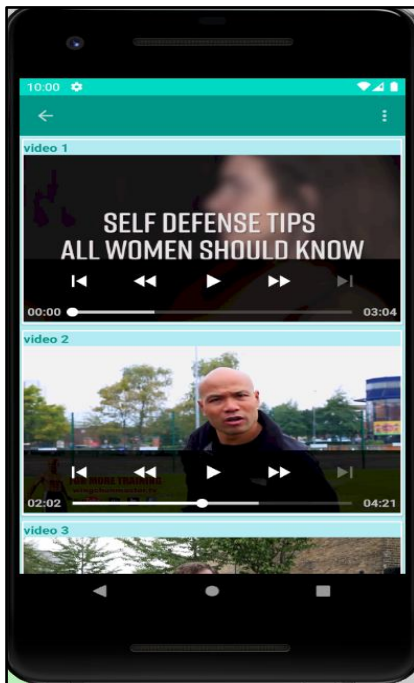
Screenshot 5.4 Home Screen



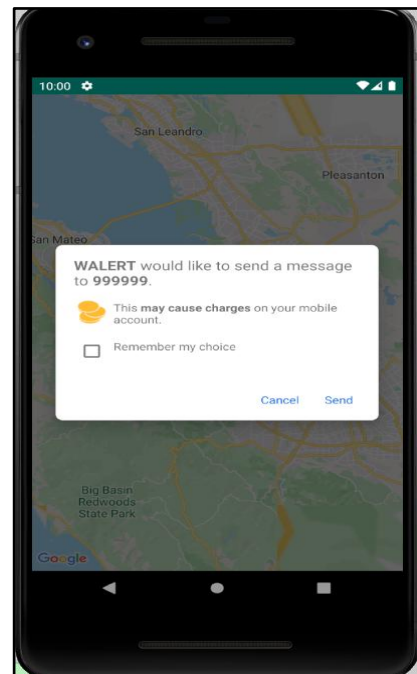
Screenshot 5.5 Call Screen



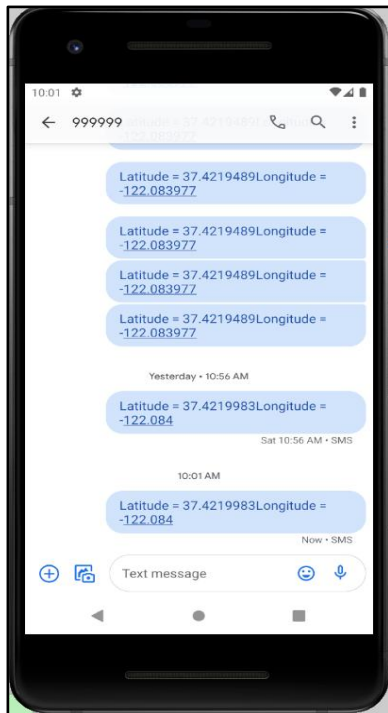
Screenshot 5.6 Emergency Contacts



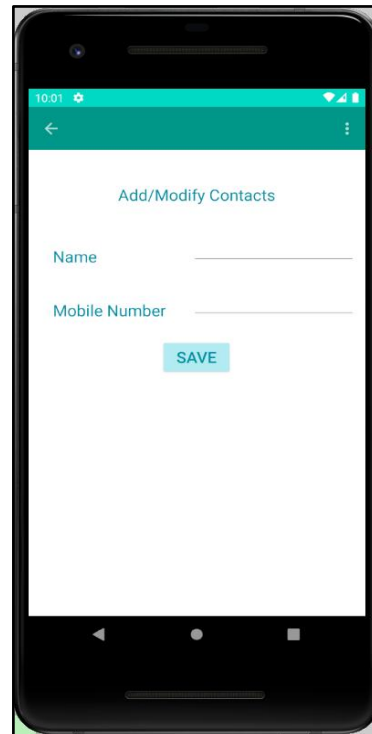
Screenshot 5.7 Self-Defence Videos



Screenshot 5.8 Send Location



Screenshot 5.9 Message Sent



Screenshot 5.10 Add Contacts

## VI. RESULT

W-ALERT app is implemented using Android Studio 4.1.2 and java as a Coding Language. The application is developed in such a way that almost all the versions of mobile can support it. Figure 1.2 describes the icon of the application as a woman which covers a lot of beauty around herself needs to be safe and to keep women safe men has to take responsibility. This implementation contains different icons for easily recognizable as for voice calls, video calls, chats, videos, location, camera, etc. The application consists of five icons buttons which provide five different features to its users and it also has an Add Contact option in the menu bar where the users can store the name and contact number of the individuals, from whom they need help in the case of critical situations. The first icon is for calls which are used for calls directly to an individual which they stored in Emergency Contacts. The Second icon i.e. the Emergency Contacts icon which consists of police, Fire brigade, Ambulance numbers and other contacts which users will store in the Add Contact option. The next icon which is Chats is used for chatting, voice calls and video calls over VoIP. The next icon i.e., the Camera which is used for recording 5 to 10 second video and picture capturing as of vehicle number or for some rapist, betrayer, etc. The second last icon is for Videos which consists of Self-Defense Videos inbuilt in the application for learning techniques for dangerous situations. The last button is which is most important i.e., the Send Location button which helps in sending the current location of the particular women to the Emergency Contacts which they have saved in. Besides all of these features in upper right corner there is a menu bar which provides four different options as Add Contacts, Profile, About and Logout the add contact option is to store the emergency contact the second option is for setting up profile the next option is for information regarding the application as in version of the application and all other information and the last option is for help with the help of these users can ask their questions.

## VII. CONCLUSION

This research paper discusses all of the W-ALERT App's functionality and services. This application will act as a digital security for women to ensure their safety. This application can run on any of the devices which are Android operating systems. This application provides different features for sending location, for video calls, for camera, for chats, for self-defense videos, etc. The main advantage of this application is, it has 5 different functions integrated in a single application. It will ensure the protection of women to a larger extent because of its 6 different characteristics it has a





greater impact. As a result, this application will last a long time and will undoubtedly minimize the limit of becoming a victim. W-ALERT application will be developed with some features like Send Location directly to the police and women's NGO, Available Hospitals and nearby Police station addresses in emergency cases.

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