

WOMEN SAFETY APPLICATION USING FLUTTER FRAMEWORK

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Abstract - In today's world, people using smartphones have increased rapidly, and hence, a smartphone can be used efficiently for personal security or various other protection purposes. Many unfortunate incidents have been taking place in women's cases. Problems may come from any direction such as women walking on the road after work, going to supermarkets or many other reasons for which they go alone. Whether you are in instant trouble or got separated from friends during the night and do not know how to reach home, having these apps on your phone can diminish the risk and bring assistance whenever required. The user can easily and discreetly trigger the application and activate the services by pressing a hardware button of her phone, or by explicitly interacting with the user interface of the application. A message containing the geographical location of the user, surrounding photograph, and audio will be sent to the registered emergency contacts & alert the police portal. Our motto in developing this app is to provide a safe environment to women through smartphones as today most of us carry smartphones wherever they go. Of course, the Delhi Nirbhaya case has made the Government make the laws tougher, but even though the sexual crime rate in India has not decreased. So, it is better to take our safety measures rather than becoming a victim of those crimes.

Key Words: activate, application, geographical location, safety, smartphone

1. INTRODUCTION

With the help of the internet, every machine is controlled, which makes people's lives easier. Nowadays girls were not permitted to move freely in the streets where they were abused by strangers. Parents are distressing about their safety which has become the first barrier to send their daughters outside. Gradually the women's harassment has risen. Safety is the most required power for everybody in today's world in the current generation. In our country, even though there is economic development, there are still many crimes happening against women.

With the help of the technology & internet, we can control and access the machines and things that are connected to the internet even if the distances are too long. Without human-human and computer-human interaction, we can send and receive information. But the harassment, rape, acid attack is still not reduced. To make them safe, a smart device is developed. The women's safety devices should be very simple, easy to carry, and should be integrated with several functionalities. We aim to make women feel empowered, confident and strong enough to fight the parasites prevailing in our society. What is expected is a system that shall re-establish how very gregarious mankind is. However, for women to tackle eve-teased by random strangers, know that the first thing that comes to your mind is not opening an app on Google Play Store or App store! The presence of mind goes out the window and you just look for an escape route. A system should be developed to tackle unexpected problems.

With the help of the Women Safety Application, the registered user can trigger an event and report any emergency. Apart from sending the location coordinates, the application captures images and records the surrounding audio for 10 seconds. This data will be reported to the registered emergency contacts and will also act as a piece of digital evidence. This is a user-friendly application that can be accessed by anyone who has installed it on their smartphones. We intend to provide you with the fastest and simplest way to contact for help. This is an automated and efficient way of using the internet and application in this case of emergency.

2. LITERATURE REVIEW

Ravi Sekhar Yarrabothu, Bramarambika Thota, "Abhaya" [1] - In today's world, people using smart phones have increased rapidly and hence, a smart phone can be used efficiently for personal security or various other protection purposes. The heinous incident that outraged the entire nation has wakened us to go for the safety issues and so a host of new apps have been developed to provide security systems to women via their phones. This paper presents Abhaya, an Android Application for the Safety of Women and this app can be

activated this app by a single click, whenever need arises. A single click on this app identifies the location of place through GPS and sends a message comprising this location URL to the registered contacts and also call on the first registered contact to help the one in dangerous situations. The unique feature of this application is to send the message to the registered contacts continuously for every five minutes until the “stop” button in the application is clicked. Continuous location tracking information via SMS helps to find the location of the victim quickly and can be rescued safely.

Mr. Indrajeet A. Mane, Miss. Jyotsna R. Babar, Miss. Snehal S. Patil, Miss. Sarika D. Prof. Nikita R. Shetty, “Stay Safe”^[2] - Stay Safe Application is an innovative safety application for women, senior citizens and anyone who needs assistance in an urgent situation. This project focuses on providing security to users which includes location-based services, SMS services, GPS services and system Architecture, provide useful evidences. Since the system can capture image of incidences which can act as the evidences. This is the “Stay Safe App” which is very useful application mainly for girl’s safety. When we feel that we are in emergency situation, for example, travelling alone at night time we can use this application. So that on one click we can send our location to our family members and to any police stations. So, once we click on activate button it continuously sends updated locations messages to all authorized persons. So, this application is having both safety and security which needs the engineering code of conduct which is essential in the today’s world.

Tanusri Dey, Upama Bhattacharjee, Sanjana Mukherjee, Tripti Paul, Rachita Ghoshhajra, “Advanced women security app: We’RSafe”^[3] - The phrase “Violence against women” is a technical term used to collectively refer to acts that are primarily or exclusively committed against women to harm them. Woman security is a critical issue and it is much needed for every individual to act over such issue to safeguard them. When safety and security is concerned, a smart phone can become a powerful tool to prevent violence against women. Keeping this in mind, an android app has been developed which is dedicated to provide relief to the person in trouble. By clicking on a button (provided on the app) alert message is sent to the user’s already saved contacts. The application shares the user’s location with the registered contacts in the form of message. The application has other key features like “Alarming neighbours by loud noise”, “AutoDialing”, “Finding location of nearby police station and hospitals”

etc. The work is developed in Java Development Kit using Android Studio. Thus, the app acts like a sentinel following behind the person till the user feels she is safe.

R. R. Khandoker, S. Khondaker, Fatima-Tus-Sazia, F. N. Nur and S. Sultana, “Lifecraft”^[4] - Women have ensured the stability, progress and long-term development of the nations throughout the history. If women are subjected to violence and harassment, they cannot be genuinely included in society. With increasing heinous incidents involving women and children, an advanced system is needed to serve the purpose of getting help as soon as possible. At present time, the use of smartphones has increased rapidly, making it possible to use a smartphone efficiently for security or other protective purposes. All the recent atrocious incidents have made us think about to go for the safety issues. The crimes against women can be minimized with the help of our application “LifeCraft”. It is an application for android for women’s safety though men can also use it at a distress situation. It can be activated by voice command or SOS key. An alert message with location is sent to the user defined numbers in every five minutes until the system is turned off. Many cases remain mysterious due to insufficient evidence. So, we have kept audio recording option to keep evidence. Continuous location tracking, showing the victim safe zone, offline mode is some of the most useful features of this system.

Mr. Kalyan D Bamane, Nelofer kousar, Gauri butte, Atul anand, Manisha Patil, “An Implementation and Efficient Way”^[5] - Safety for women is one of the most pressing issues of our time that should have been a fundamental, undeniable concept for any civilized society centuries ago. Denying fundamental rights to safety, personal choices, freedom to pursue, whatever lifestyle they wish to, sexual and physical empowerment are not new issues – but have strangely not managed to be eradicated even in today’s times. This is a privacy security app having troop of features; GPS tracking, emergency & important contact numbers, directions to safe locations, pins displaying danger zone area and a Safety Score. It drives in advance of exemplary women safety apps, and presents a vast range of features, so that, they will help to practically plan and can give a counter attack to those spots in the locality. When a person is moving to a new locality that is unknown to her and if she needs to know the safe areas, then this app will be much helpful, providing the user, a map-based view of the locality along with its safety score. This paper presents, an Android Application for the Safety of Women and this app can be

activated this app by a single click, whenever need arises. A single click on this app identifies the location of place through GPS and sends a message comprising this location URL to the registered contacts and also call on the first registered contact to help the one in dangerous situations.

3. HARDWARE & SOFTWARE USED

3.1 Hardware

- OS version: Windows 10 64-bit
- Storage: 5 GB SSD
- Tools: Windows PowerShell 5.0+, Git 2.29.2, Android Emulator
- CPU: Intel Core i5-8400
- Memory: 8 GB RAM
- Android Smartphone: Lollipop 5.0 +, Camera: Minimum 5 pixel.

3.2 Software

- IDE Used: Visual Studio Code
- Framework: Flutter
- Backend: Firebase
- Services: Geolocation API, Twilio, Camera, Microphone

4. PROPOSED SYSTEM

4.1 System Architecture

There's a one-time registration that requires the user(s) to fill out their details and that of the emergency contacts. The user can then login through any device. The user can modify the details given at the time of registration. The details will be verified and the profile will be approved. The user doesn't need to open the app to activate it. On the mobile device press the volume button which will trigger the app to register it as an emergency. Immediately, your emergency contacts, as well as the local security authorities, will be notified that you are possibly in an emergency situation along with exact GPS coordinates, captured images and the voice recording. Simultaneously, the police control room/local authorities are also notified so that they can immediately take action and can monitor your location. The figure given below refers to the proposed system architecture:

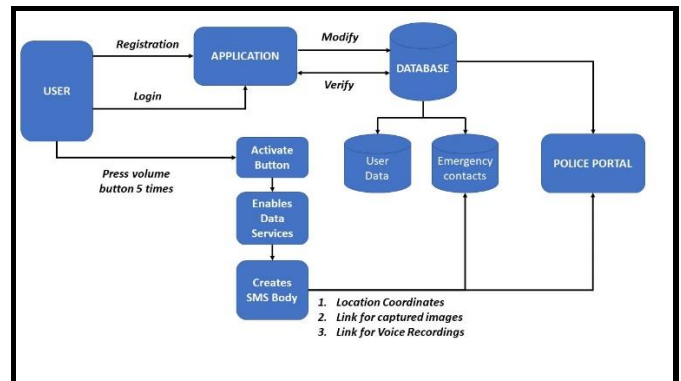


Fig -1: System Architecture

4.2 Use Case Diagram

In the figure, there are three actors named user, guardian and police personnel. The user can install the application and grant permission for the SMS service, Camera, Microphone and Location of the device. The user can register to the application and add details such as name, phone number, email and set password. Also, they can add, modify and delete three emergency contacts (guardians contacts). Users can change the credentials, login to the application, access the shield and press the volume button. The role of guardian is just to receive a message when the user triggers an emergency. The police personnel can access the police portal and receive the emergency message.

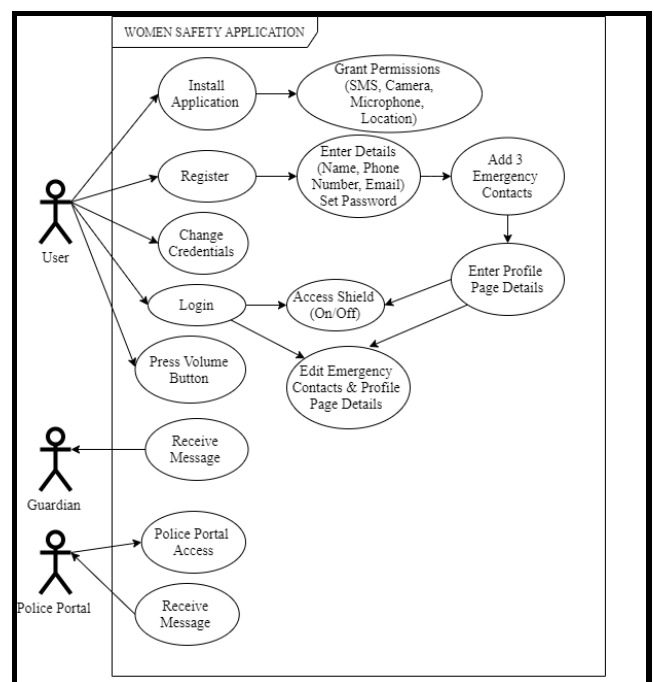


Fig -2: Use Case Diagram

5. METHODOLOGY

We have developed a cross platform application using Flutter Framework. The application is based on a single dart codebase and it runs on both Android and iOS Platform. We adopted Agile mobile app development methodology i.e., incremental and iterative approach.

5.1 Modules

1. User: Via, this module user can login and register to the application. After successful registration, the user can access the shield page. In order to register the user will need to enter some personal information such as name, phone number, email, secret password.
2. Emergency Contacts: The main information i.e., five most trusted contact numbers with the person 's name and phone number.
3. Database: The Backend and Authentication will be handled by Firebase. Firebase provides services such as Authentication, Cloud storage, real-time databases and Hosting.
4. SMS: Sending SMS via Twilio Programmable API

5.2 Application Flowchart

1. Download the application on a smartphone and start it.
2. A welcome screen is displayed and prompts the user asking whether she is a previous user.
 - a. If yes, Login to the application by entering the valid credentials.
 - I. If Authentication is successful, check whether emergency contacts are added or not.
 - i. If Emergency contacts are added, grant access to the shield page.
 - ii. If Emergency contacts are not added, direct to Add emergency contacts page.
 - II. If Authentication is unsuccessful, click on Forget Password and verify email and phone number.
 - b. If No, the user has to register to the application and enter their name, email, phone number and set a password. Then, they can add Emergency contacts and complete their profile. Then, the user can access the shield.
3. If the Shield is on and at the same time Volume button is pressed, safety mode will be activated.
4. When the safety mode is activated, the application will collect real time location coordinates, voice recording

- for 30 seconds and will capture images of the surroundings.
5. The real time location coordinates will be converted to address string using API and voice recording as well as images will be uploaded to the server and a link will be generated.
6. Then a message body, consisting of the location, voice and images link will be sent to registered emergency contacts and police portal.
7. If the Shield still remains on, the process of activating safety mode will be repeated.

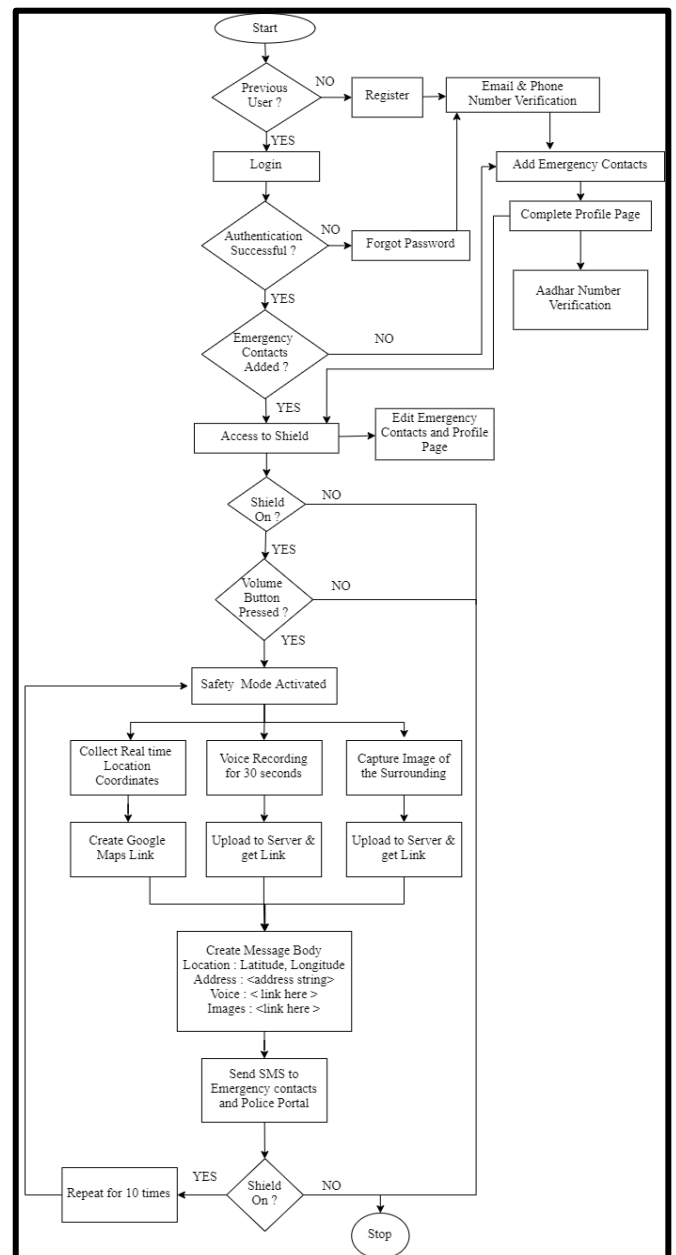


Fig -3: Flowchart of Application

5.3 Wireframing & Prototype

Wireframing helped us in understanding the future functionalities of the application. We made a sketch of the envisioned product which helped us to uncover the usability issues. This helped us in refining the user interface and arranging all components of the design in the right way.

5.4 Design & Development

The front-end of the application is developed using Flutter. This is the client-side development i.e., creating a presentation layer of the application for a direct user interaction. The application consists of a Login page, Registration page, Shield Access (On/Off), Contact's page, Profile page, Settings page and Sign in/Security page.

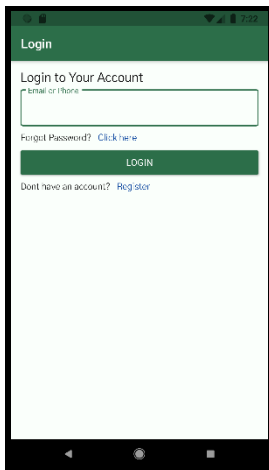


Fig -4: Login

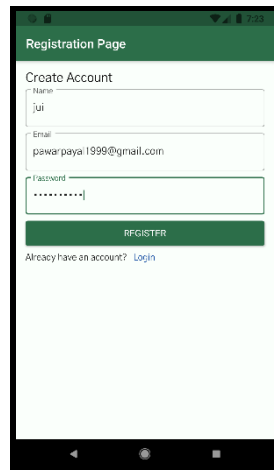


Fig -5: Register



Fig -6: Home Page

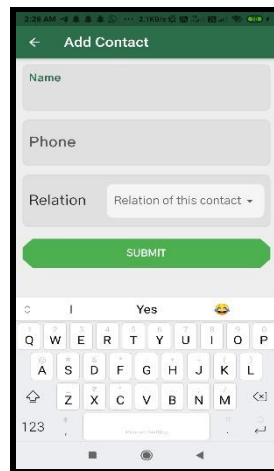


Fig -7: Add Contacts

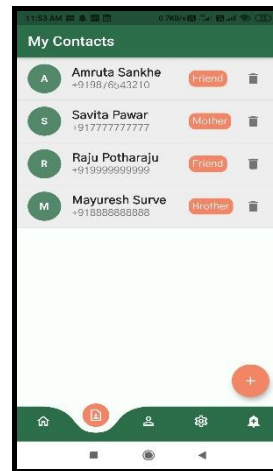


Fig -8: My Contacts



Fig -9: Update Profile

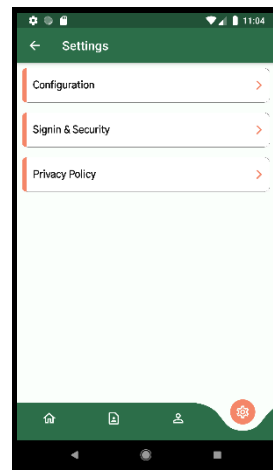


Fig -10: Settings

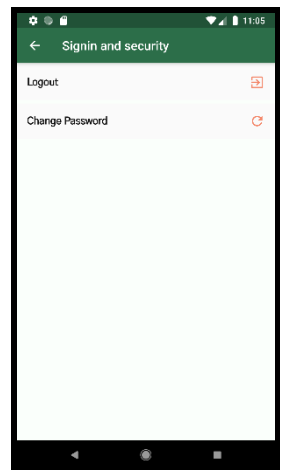


Fig -11: Sign in & Security

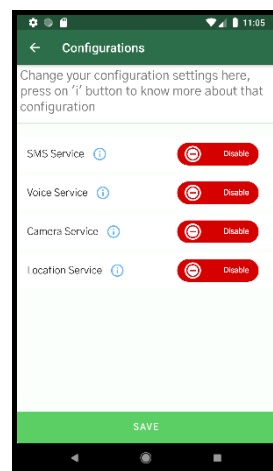


Fig -12: Configuration Disable

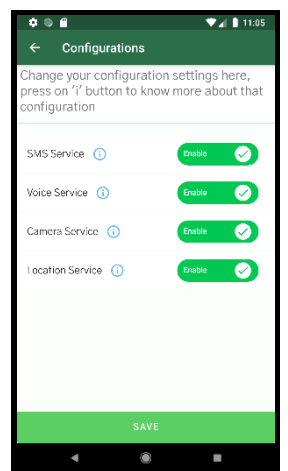


Fig -13: Configuration Enable

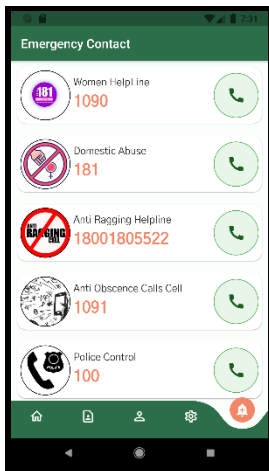


Fig -14: Helpline

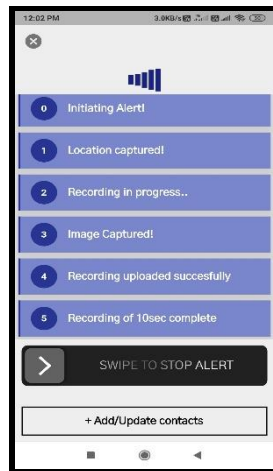


Fig -15: Emergency Triggered

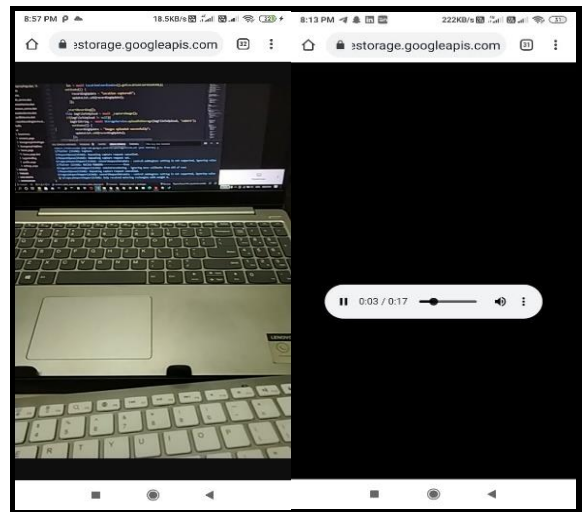


Fig -18: Image Captured

Fig -19: Audio Recorded

5.5 Sending SMS through Twilio

The message is sent to the registered emergency contacts when the user activates the services by pressing the volume button 5 times. The user Location coordinates are sent via SMS. Twilio Programmable SMS API is used for sending the information to the emergency contacts.

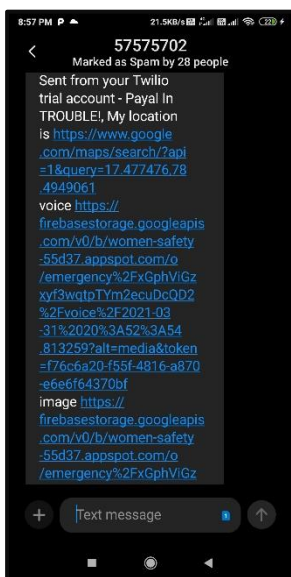


Fig -16: SMS Received

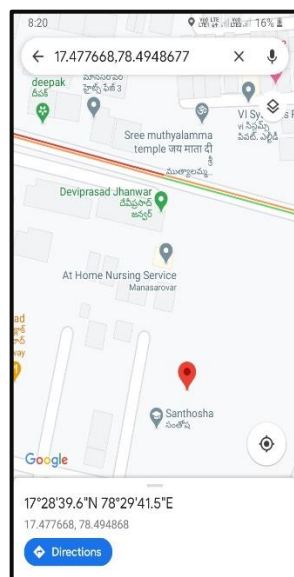


Fig -17: User Location

6. CONCLUSION

This paper represents the development of a hybrid/cross-platform mobile application system. The application is developed using Flutter (Dart Language). The Basic features of this Application will include activating the application through a hardware button to activate the app, sending a report consisting of the user's current location, surrounding photograph & voice recording to registered emergency contacts. User interface of application is developed using flutter framework & is integrated with the firebase database along with authentication. The feature of sending the user's current geolocation, surrounding images captured from the rear camera & voice recording to registered emergency contact is implemented successfully. Aadhar authentication, triggering the application with hardware button & alerting the police portal will be implemented in future.

REFERENCES

- [1] Ravi Sekhar Yarrabothu, Bramarambika Thota, "Abhaya: An Android App for the Safety of Women", Institute of Electrical and Electronics Engineers, INDICON 2015
- [2] Mr. Indrajeet A. Mane, Miss. Jyotsna R. Babar, Miss. Snehal S. Patil, Miss. Sarika D. Prof. Nikita R. Shetty, "Stay Safe Application", International Research Journal of Engineering and Technology, Volume: 03 Issue: 05 | May-2016
- [3] Tanusri Dey, Upama Bhattacharjee, Sanjana Mukherjee, Tripti Paul, Rachita Ghoshhajra,

- "Advanced women security app: We'RSafe", International Information and Engineering Technology Association, Vol. 4, No. 2, June 2017, pp. 47-51
- [4] R. R. Khandoker, S. Khondaker, Fatiha-Tus-Sazia, F. N. Nur and S. Sultana, "Lifecraft: An Android Based Application System for Women Safety," 2019 International Conference on Sustainable Technologies for Industry 4.0 (STI), Dhaka, Bangladesh, 2019
- [5] Mr. Kalyan D Bamane, Nelofer kousar, Gauri butte, Atul anand, Manisha Patil, "An Implementation and Efficient Way to Improve Women Safety Empowerment", International Research Journal of Engineering and Technology, Volume: 07 Issue: 02 | Feb 2020
- [6] Ramya K, Vimal T, "SURVEY ON WOMEN SAFETY DEVICES", International Research Journal of Engineering and Technology, Volume: 07 Issue: 08 | Aug 2020
- [7] N. Saranya, Mr. K. Karthik, "Women Safety Application using Android Mobile", International Journal of Engineering Science and Computing, ISSN-2321 -3361, 2015
- [8] Dr. Sridhar Mandapati, Sravya Pamidi, Sriharitha Ambati, "A Mobile Based Women Safety Application (I Safe Apps)", IOSR Journal of Computer Engineering, Volume 17, Issue 1, Ver. I (Jan – Feb. 2015), PP 29-34
- [9] Miss. Nikita Shinde, Mr. Dipak Bhosale, Mr. Anurag Kulkarni, Miss. Shubhangi Rakate, "AWSM - Android based Women Security System", International Journal of Innovative Research in Science, Engineering and Technology, Vol. 8, Issue 4, April 2019
- [10] Zeel Mewada, Kinnal Panchal, Nidhi Patel, "AN APPROACH TOWARDS WOMAN SAFETY: SAFEGIRL APPLICATION", International Journal of Research and Analytical Reviews, June 2019, Volume 6, Issue 2