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# Safe Sphere

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**ABSTRACT:** Enhancing Personal Safety through Technology, Ensuring personal safety, particularly for women is a growing concern. The Safe Sphere App is an Android application designed to enhance security through real-time location tracking, SOS alerts. It features a panic button activated via a triple press of the power button or voice command, instantly sending the user's location to emergency contacts. Utilizing the Google Maps API, it ensures precise tracking and swift response. The app comprises three modules: User, Guardian, and Admin, facilitating emergency management. With SQLite for local storage and offline functionality, Safe Sphere serves as a reliable safety tool, leveraging technology to address critical societal issues.

**KEYWORDS:** Personal safety, mobile security, emergency response, women's safety.

## I. INTRODUCTION

The safety and security of women in today's society have become significant concerns due to increasing incidents of violence and harassment.[4] In response to this, technology can play a crucial role in empowering women and providing tools to ensure their safety in emergency situations.[6] This project, the the Women Safety App, is an Android-based solution designed to address these concerns by offering real-time location tracking, emergency alert mechanisms, and reliable communication features. The app incorporates a panic button mechanism that allows users to send SOS alerts to predefined emergency contacts and local authorities. The activation of the panic button can be done through a triple press of the power button ensuring ease of access during critical situations. Upon activation, the app sends the user's location and SMS to emergency contacts, enabling them to respond quickly. Additionally, the app updates the user's location until they mark themselves as safe.[2] It also includes modules for guardians, who can monitor the user's safety, and an admin module, which provides an overview of user activities and alerts.

SQLite is used for local data storage to ensure data persistence, while the Google Maps API facilitates location tracking. This project demonstrates the integration of modern technology with social responsibility, providing a practical and accessible tool to enhance the safety of women.[7] By bridging the gap between safety concerns and technological advancements, this app aims to serve as a dependable companion during emergencies, ensuring peace of mind for both users and their loved ones.

The project addresses the growing concern of women's safety by integrating technology-driven solutions such as, SMS-based emergency alerts, and a panic button for quick activation. By ensuring offline functionality through SMS communication, the app remains reliable even in areas with poor internet connectivity. [14]

Additionally, the app seeks to:[8]

- Provide Quick Emergency Response
- Ensure Accessibility and ease of
- Enhance reliability

This project aims to create a safer environment for women, giving them greater confidence and security in daily life.

### Additional Benefits of the Safe Sphere App:

1. **Quick Emergency Response:** The panic button ensures immediate alert transmission to emergency contacts, enabling faster assistance. [6]
2. **User-Friendly Interface:** Simple registration and easy-to-use features make it accessible for all users. [15]
3. **Guardian Monitoring:** Allows trusted guardians to track location and receive emergency alerts.[18]
4. **Administrative Oversight:** The Admin Module enables monitoring of emergency alerts for better security management.
5. **Privacy and Security:** Data is stored securely using SQLite, minimizing risks of unauthorized access.

**Community Impact:** Enhances public safety, particularly for women, by leveraging mobile technology for real-world security solutions.

## II. LITERATURE SURVEY

As a part of literature survey, we investigated some applications of women safety that already exist in market. The aim is to observe how these applications work and to see how they can be improved and how are they different. To date it is identified that the following Android Apps of women security are good and are offering relatively similar service.

Dr. K Srinivas, Dr. Suwarna Gothane, C. Saisha Krithika, Anshika, T. Susmitha (2021)[1] proposed an android app for women safety in that the rapid increase in smartphones with GPS enables their use for personal safety, especially for women. This app activates with a single click, continuously sending location updates via SMS to registered contacts until the user signals safety. It acts as a virtual sentinel, ensuring quick rescue. The system addresses threats to women's safety through real-time tracking and emergency alerts. [1]

Dr. Sridhar Mandapati, Sravya Pamidi, Sriharitha Ambati (2015) discussed about A Mobile Based Women Safety Application (I Safe Apps) [2] on protecting women's safety? The main purpose of their study is to explore the use of smartphone's in relation to domestic and sexual violence. In report violence against women is a global public health problem, 35% of women worldwide have experienced either physical and/or sexual intimate partner violence or non-partner sexual violence. The report also details the effects of violence on women's reproductive and mental health. In [5] the authors seek to place questions of surveillance technologies into a theoretical framework that foregrounds the challenges that new surveillance technologies pose to anti violence movements. Specifically they address the impact of surveillance technologies in the practice of violence and some proposed solutions, and consider the ways that surveillance technologies are used disproportionately in the criminalization of marginalized groups. By placing violence against women at the centre of analysis aim to complicate concerns related to surveillance technologies.[3]

Vaishnavi Zagale, Asiya Tigale, Bhavika Todsam and Prof. S.G.Nandanwar describes that Violence against women remains a significant societal concern. This paper introduces a novel Android application built with the Flutter framework to empower women with a tool for improved personal safety. The core feature involves real time location sharing triggered by a discreet gesture recognition system. Shaking the device three times, for example, activates an emergency response, promptly notifying pre-selected contacts. [4]

Dr. R. P. S. Manikandan, Ashwin G, Chandru A, Muraliprasad M describes that Women's safety is a fundamental and ongoing issue affecting millions of women around the world. Fear of violence, harassment and persecution can create significant obstacles and limit their mobility and freedom. In response to these challenges, we developed the Women Safety Project app, an easy-to-use mobile app that aims to provide women with effective tools and resources to help them stay safe. The app takes into account women's particular safety concerns, such as traveling alone at night with the number or navigating in unfamiliar places. [5]

Shubham Nikam, Jay Hiray, Kalpesh Gaikwad, Prof. Smita K Thakare describes A female safety (FEMS APP) which shows that Women's safety is crucial. This app prevents crimes by sending instant alerts and tracking location, ensuring quick assistance in emergencies. [6]

Akash Akare, Aditya Gahile, Aniket Vishwas, Vaibhave Fokmare describes that This research paper aims to review the current state of women safety applications and identify potential areas of improvement for future development. With the increasing rate of violence against women in various parts of the world, there is a need to provide women with tools that can help them stay safe and protect themselves in threatening situations. The paper analyses various existing applications that are available on the market and highlights their strengths and limitations. It then discusses the key features that should be included in women safety apps and suggests potential directions for future research and development. [7]

In SURAKSHA: Women Safety Application Milind M. Patwardhan, Ishika R. Kale, Deep A. Kale, Nirjala R. Kale Describes that Women's safety is a crucial concern in our country and requires attention and action. The widespread use of smartphones can be leveraged to address this issue. To this end, we have developed an application called "SURAKSHA: Women Safety Application." In case of an emergency, the user can trigger the application through their

smartphone to ensure their security quickly and easily. The application features various functionalities to help the user deal with critical or dangerous situations effectively. [8]

In [9] Kunal Kataria, Rushikesh Khade, Prof. Sonal Chanderi describes that The popularity of smart phones equipped with GPS navigation features has quickly increased from 3% to 20% during the past five years. Therefore, a used smart phone could be suitable for personal security or other care needs, especially for daughters. When the user believes she is in danger, this app may be activated by a unique click. This is used to send messages informing the recorded contacts of the consumer's location every few seconds. Continuous location tracking information through SMS makes it possible to locate the victim's neighbourhood quickly and maybe with caution. This request aims to ensure the safety of women. [9]

In Women Safety App To Detect Danger And Prevent Automatically Using Machine Learning Kopanati Shankar, Siripurapu Chalice Prajwal, Sunkari Bhanu Prakashn describes that The application integrates audio sensing, machine learning, cloud storage, and geolocation to address women's safety concerns. It utilizes audio sensors to monitor the surroundings, employing a TensorFlow Lite model trained on audio samples to detect potential threats. The Java-based Android app responds to triggers by issuing alerts and initiating audio-video recording if unacknowledged. Geolocation determines the user's location, shared with nearby police along with cloud-stored data. Emergency contacts aid communication during crises. The app displays nearby safe places, and rigorous testing ensures accuracy, reliability, and security.

In [24] Prof. Kishore Sakure describes that Women's safety is a major concern due to rising crimes. This app provides a quick SOS feature, sending real-time location updates to emergency contacts and police. It ensures continuous tracking until the user confirms safety, offering reliable security solution through smartphones. [24]

### III. METHODOLOGY

The development and implementation of the Safe Sphere App follow a structured approach to ensure reliability, usability, and effectiveness in enhancing personal safety. The methodology consists of the following key phases:

#### 1. Requirement Analysis

A detailed analysis was conducted to identify the primary safety concerns faced by individuals, particularly women. Surveys and interviews were utilized to gather insights from potential users, security experts, and stakeholders to determine essential features.

#### 2. System Design

The application architecture was designed based on a modular approach, incorporating three primary modules:

- **User Module** – Allows users to register, log in, and configure emergency contacts.
- **Guardian Module** – Enables designated guardians to monitor user locations and receive SOS alerts.
- **Admin Module** – Provides oversight, including emergency alert management and user monitoring.

The system was structured to ensure seamless communication between these modules while maintaining data security and privacy.

#### 3. Technology Stack Selection

The application was developed for the Android platform using:

- **Programming Languages:** Java for Android development.
- **Database:** SQLite for local data storage to enable offline functionality.
- **APIs:** Google Maps API for location tracking.

#### 4. Implementation and Development

The app was developed using an iterative approach, ensuring continuous testing and improvement. Key functionalities such as panic button activation (via power button press or voice command), SOS alerts, and continuous location sharing were implemented and refined.

#### 5. Testing and Evaluation

The app underwent rigorous testing, including:

- **Unit Testing:** Ensuring individual components function correctly.
- **Integration Testing:** Verifying seamless interaction between modules.
- **User Acceptance Testing:** Conducting trials with a test group to evaluate usability, accuracy, and response time.

Performance was assessed in different network conditions to validate offline functionality.

#### 6. Continuous Improvement

Based on user feedback and security evaluations, iterative updates are planned to enhance features, improve efficiency, and expand compatibility across different Android devices.

This methodology ensures that the Safe Sphere App remains a robust, reliable, and user-friendly personal safety solution.

### IV. DIAGRAMS

#### ➤ FLOWCHART

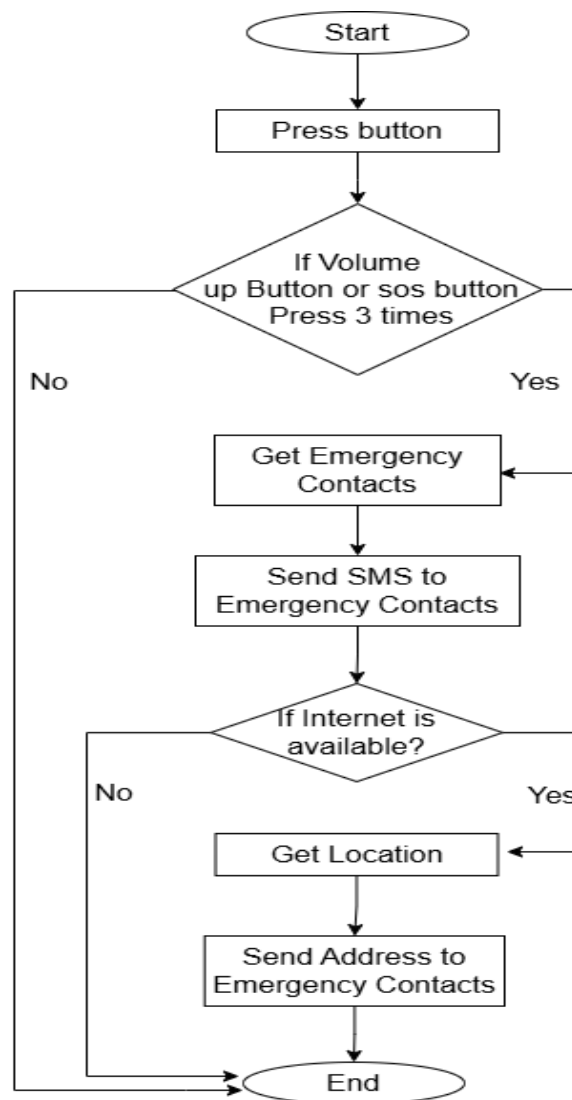


Fig 4.1: Flowchart of the application

➤ USE CASE DIAGRAM

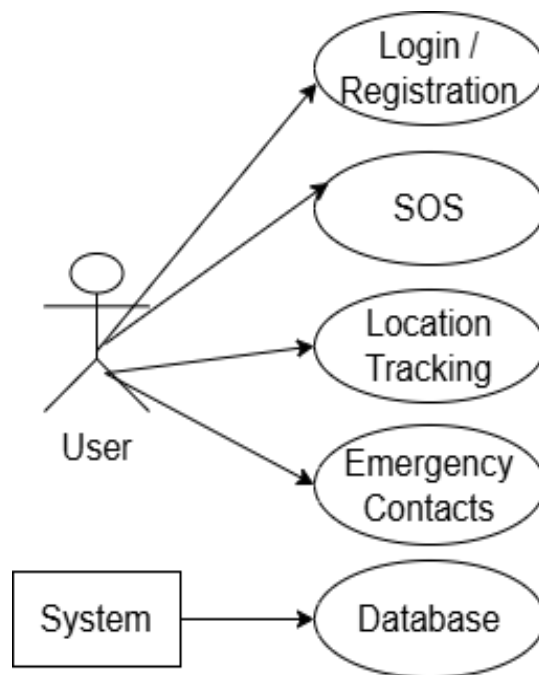


FIG 4.2: USE CASE DIAGRAM

## V. IMPLEMENTATION

This android application is useful for womens when she is in some problem or needs any help, they simply need to open the app and click on the “HELP” button. This application sends the message to those contact numbers which she has stored. And also sends the location. The total evaluation can be done in three major steps which are described individually. Evaluation describes the whole implementation of the application in three major steps. The first major step is to enter the contact details in the application created. Those contacts can be our relatives or friends and chief cop of the particular city the person we live in. When the application is installed in the smart phone for the first time the above contact details should be provided. The application will save the given information. The second major step, this step is followed only when the volume button is pressed 3 times than emergency music will ring.

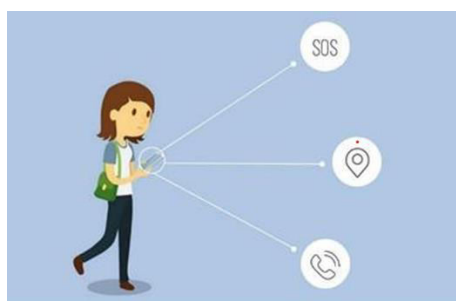


Fig 5.1: Implementation of proposed work.

## VI. CONCLUSION

The Safe Sphere mobile application for women's safety is an innovative and essential solution designed to provide real-time assistance in emergencies. Throughout the development process, various technical, security, and usability challenges were identified and addressed to ensure a reliable and user-friendly experience.

The app successfully integrates location tracking and emergency alerts to enhance safety and response efficiency. Key optimizations were made to improve battery consumption, network reliability, and data security, ensuring the app functions effectively under various conditions.

Through rigorous testing and user feedback, the application was refined to offer a seamless, fast, and secure experience. The project highlights the importance of leveraging technology for social good, demonstrating how mobile applications can be used to enhance personal security and provide immediate assistance in distress situations.

Future improvements could focus on AI-powered threat detection, better offline capabilities, and broader integration with law enforcement agencies to further strengthen the effectiveness of the app. With continuous enhancements and wider adoption, Safe Sphere has the potential to become a lifesaving tool for women's safety worldwide.

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