



KEEPR: A HUMAN SAFETY APPLICATION

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Abstract : An Android-based mobile app built to provide quick, reliable, and automated help during emergencies. With just a few taps or even a discreet triple press of the volume button users can instantly send alerts to their trusted contacts through WhatsApp and SMS, sharing their real-time location so that assistance can reach them without delay. Keepr also goes a step further by using the Haversine formula to locate and display the nearest police station, giving users direct access to official support when needed most. All user and contact information is securely stored using Firebase Authentication and Firestore Database, ensuring both safety and accessibility of critical data. Powered by technologies such as Google Maps API, Firebase, and Telephony Services, Keepr ensures fast, reliable communication even in areas with poor connectivity. Its dual alert system makes sure that messages get through no matter the situation. Overall, Keepr is more than just an app it's a trusted digital companion designed to keep people safe. By combining smart technology with real-world needs, it bridges the gap between individuals in distress and their loved ones or local authorities, proving how innovation can truly make a life-saving difference

IndexTerms - Human Safety, Emergency Response, Location Sharing, SMS Alerts, Android Application, Firebase, Firestore

I.INTRODUCTION

In today's fast-paced world, personal safety has become a major concern for everyone, especially in busy urban and semi-urban areas. The rising number of accidents, crimes, and emergency situations shows just how important it is to have quick and reliable ways to get help when it's needed the most. Technology, particularly mobile applications, has stepped in to fill this gap, offering tools for real-time communication, location tracking, and emergency response.

Our project, "Keepr : A Human Safety Application", is designed to enhance personal safety by providing a fast and dependable emergency alert system. Built for Android, Keepr uses Google Maps to track your current location, making help just a click or even a simple button press away. When an emergency occurs, the app sends alert messages via WhatsApp to up to five registered contacts, and simultaneously delivers SMS alerts. This dual approach ensures that your calls for help are always heard.

One of Keepr's standout features is its ability to locate the nearest police station within a certain distance from your location. Using the Haversine formula, the app calculates the shortest distance between you and nearby stations, providing details like name, address, and contact number. This ensures that law enforcement support is just a tap away when you need it most.

Keepr also includes a secure contact management system, where emergency numbers can be safely stored and easily accessed. All user information and contacts are saved in Firebase and Firestore databases, ensuring both security and reliability. A particularly innovative safety feature is the triple volume button press, which automatically initiates a phone call to a saved contact perfect for discreetly alerting someone when you're unable to operate your phone directly.

By combining real-time location tracking, multiple communication channels, and smart emergency triggers, Keepr offers a comprehensive approach to personal safety. Beyond being an emergency tool, it gives users peace of mind, helping them feel secure while commuting, traveling, or navigating unfamiliar areas. This project highlights the power of technology in safeguarding lives and demonstrates how thoughtful design can make a real difference during critical moments.

II.LITERATURE REVIEW

Research in mobile personal-safety systems has grown alongside smartphone adoption and better location services. Early apps focused on simple SOS functions, sending predefined SMS messages with the user's location. While useful, these systems relied entirely on manual activation and struggled in poor network conditions. Later solutions introduced redundant communication, combining SMS and internet-based alerts to ensure messages reach recipients even under varying connectivity. Location tracking and mapping have been key areas of focus. Many apps use GPS and map APIs to send coordinates, but accuracy depends on sensor quality and sampling methods. Using techniques like the Haversine formula to identify nearby emergency services makes alerts more practical by guiding users to help quickly. Optimized location strategies, such as adaptive sampling or fused providers, help reduce battery drain while maintaining real-time tracking.

Discreet user-trigger mechanisms have also evolved. Beyond on-screen buttons, options like shake gestures, voice commands, and hardware-key combinations have been explored. Research shows hardware triggers, such as rapid volume button presses, are particularly effective because they work when the screen is locked and are less likely to alert potential threats. Communication

channels are also critical: combining SMS with popular messaging apps like WhatsApp ensures alerts are delivered reliably and quickly. Keepr builds on these insights by integrating proven strategies while addressing common limitations. It features a triple volume button trigger, dual-channel alerts (WhatsApp + SMS), Haversine-based nearest-service lookup, and secure Firebase storage. By combining discreet activation, redundant communication, accurate location tracking, and robust data management, Keepr offers a fast, reliable, and user-friendly personal safety solution designed for real-world use.

III. RESEARCH GAP

Even with the growing number of mobile safety apps today, there's still a noticeable gap between what users expect and what these systems actually deliver. Many existing apps rely on manual triggers, requiring users to unlock their phones or press visible buttons something that's often impossible during emergencies like assaults, accidents, or sudden panic situations. Others depend on just one communication channel, such as SMS or internet-based messaging, which can fail in areas with poor connectivity.

Another limitation is the lack of integration with popular messaging platforms like WhatsApp, despite its global reach. Many apps also do not provide real-time tracking of nearby police stations or multi-layered emergency features, limiting their ability to guide users quickly to help. On top of that, older systems often store data locally, making it less secure and less reliable than modern cloud-based solutions.

This highlights a clear need for a safety application that is automated, multi-channel, and intelligent, ensuring real-time alerts, dependable communication, and secure cloud storage all within an easy-to-use interface.

Keepr: A Human Safety Application is designed to fill this gap. By combining discreet emergency triggers, dual-channel messaging, real-time location tracking, and secure cloud storage, Keepr offers a reliable, responsive, and user-friendly solution that puts personal safety first.

IV. RESEARCH OBJECTIVE

The primary goal of this research is to design and develop a comprehensive human safety application that delivers instant, reliable, and automated emergency support through multiple communication channels. The focus is on creating a system that can assist users effectively during critical situations, ensuring help is accessible without delay.

A key objective is to build an Android-based safety app that allows users to send emergency alerts quickly and efficiently. To maximize reliability, the app incorporates a dual alert system using WhatsApp and SMS, ensuring that notifications reach the intended contacts even in areas with poor internet connectivity.

Another important feature is real-time location tracking through the Google Maps API, enabling both users and their emergency contacts to know the exact location during emergencies. In addition, the app uses the Haversine formula to identify and display the nearest police station, helping users access official assistance as quickly as possible.

To make emergency activation discreet and accessible, the app includes a hardware-based trigger mechanism a triple press of the volume button that works even when the device is locked. User data and emergency contacts are securely managed using Firebase Authentication and Firestore Database, providing reliable cloud-based storage. Finally, the application will be evaluated for its speed, reliability, and user-friendliness to ensure it performs effectively in real-world emergency situations.

V. PROPOSED SYSTEM

Keepr is an Android-based safety application developed in Kotlin with XML front-end design, aimed at providing quick and reliable emergency support. Users can securely save up to five trusted contacts in Firebase Firestore, and Firebase Authentication ensures safe login and registration. The app sends alerts through WhatsApp or SMS with the user's live location, and a triple volume button press triggers an immediate call to a saved contact for discreet emergency support.

The system architecture is organized into modular layers:

A. User Interface Layer (Frontend)

Designed in XML with Kotlin, this layer offers intuitive screens for login, contact management, maps, and emergency triggers, making the app simple and quick to navigate.

B. Application Logic Layer (Middleware)

Handles the core functionalities, including emergency message generation, dual alert transmission via WhatsApp and SMS, volume button detection, and nearest police station calculation using the Haversine formula.

C. Data Management Layer (Backend)

Firebase Authentication secures user login, Firestore stores contacts and preferences.

D. External Services Layer

Integrates Google Maps API for live location tracking, WhatsApp package for instant alerts, and SMS Manager to ensure messages reach contacts even without internet.

E. Hardware/Device Layer

Utilizes mobile GPS and network sensors for accurate location, the volume button listener for emergency triggers, and mobile connectivity for seamless data transmission.

F. System Design

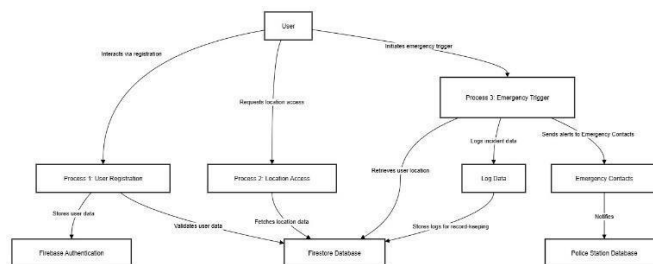


Fig. 1 Flow Diagram

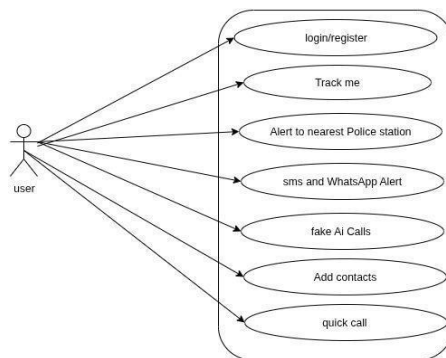


Fig. 2 Use Case Diagram

IV. RESULTS

The Keepr : A Human Safety Application successfully demonstrated its ability to provide reliable and timely emergency alerts through both SMS and WhatsApp. During testing, the SMS functionality, powered by Android's SmsManager, sent instant messages to pre-registered emergency contacts. Even in areas with limited or no internet connectivity, the messages were delivered promptly, ensuring that users could reach out for help without any delay.

Similarly, the WhatsApp integration proved effective in quickly notifying contacts. Using Intents, the app opened WhatsApp with a pre-filled emergency message, allowing users to alert up to five contacts with just a single trigger. This dual communication approach added an extra layer of reliability, complementing the SMS alerts and ensuring that help would always be reachable.

An important feature of Keepr is its inclusion of the user's real-time location in every alert. Testing showed that the GPS location shared through both SMS and WhatsApp was highly accurate, enabling emergency contacts to identify the user's exact position almost instantly. This proved crucial for scenarios where every second counts.

The discreet triple volume button trigger was also tested extensively. Users were able to initiate emergency alerts by pressing the volume button three times, even when they could not access the phone screen. This feature highlighted the app's practical usability in real-life situations where immediate manual interaction is not possible.

Overall, the results confirm that Keepr delivers a dependable and user-friendly emergency response system. By combining multiple communication channels, precise location tracking, and intuitive triggers, the app ensures that users can quickly notify their trusted contacts during emergencies, enhancing personal safety and providing peace of mind.



Fig 3. Map Naivagation (Home) Page.

VI. CONCLUSION AND FUTURE WORK

The project "Keepr : A Human Safety Application" has been successfully developed as an Android-based solution designed to provide quick and reliable support during emergencies. By combining technologies such as Google Maps API, WhatsApp and SMS services, Firebase, and Firestore, the application ensures that users are never left without help when they need it most.

Unlike traditional emergency response methods that rely heavily on manual effort, Keepr introduces automated alerts, real-time location sharing, and a discreet emergency trigger using the triple volume button press. The integration of the Haversine formula further strengthens its utility by helping users quickly locate the nearest police station, minimizing response time and improving access to assistance.

With its intuitive design, secure data management, and multiple communication pathways, Keepr delivers a comprehensive safety net for individuals in different environments. Its dual capability to work both online and offline makes it especially valuable in areas with poor connectivity, ensuring that safety is never compromised.

This project highlights the potential of technology to strengthen personal security and empower individuals in moments of crisis. While the current version already provides strong features, future improvements such as AI-powered emergency detection, integration with wearable devices, multilingual support, and global emergency service connectivity can make it even more effective and widely accessible.

In essence, Keepr not only meets its goal of protecting users in critical situations but also moves a step closer toward building a safer, more connected, and more resilient society through the power of mobile innovation.

While Keepr : A Human Safety Application already provides reliable emergency alerts and real-time location tracking, there is room to make it smarter and more responsive. Future enhancements could include AI-driven automation to detect unusual situations such as falls, sudden inactivity, or abnormal movement, triggering alerts automatically. Predictive analytics could also anticipate high-risk scenarios based on user behavior and environmental data.

The app can be extended to wearable devices like smartwatches and fitness bands, enabling users to send alerts even without accessing their phones. Accessibility could be improved through multi-language support, and communication channels could be expanded with email notifications, cloud alerts, and direct integration with official emergency numbers. Additionally, a community safety network could allow nearby users to respond to emergencies, creating a supportive network of users.

To ensure reliability and usability, Keepr could implement cloud backup and cross-platform support for seamless data recovery across devices, along with safe route suggestions and geofencing to warn users about high-risk areas. Improvements in battery optimization, offline functionality, and data security would make the app more robust, efficient, and secure, ensuring uninterrupted protection while giving users full control over their personal information.

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