Rescue Ready: A Comprehensive Personal Safety Application

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***Abstract*— Mobile applications are becoming integral for women and children by complementing their level of safety and security. This paper proposes a novel system called "Rescue Ready," a mobile real-time personal safety application for such users. The system includes several features, such as a "Danger Button" which sends an SMS alert with the user's live location, alarms the police, and starts buzzing. Rescue-ready urgent alerts the authorities and identifies the users through clear and fast communication protocols. It has been designed with a user-friendly interface, aiming at less than one second response time to allow the app to work in real-time. In this paper, we analyse system architecture along with the key features and discuss the results from its extensive testing and use of modern techniques for automated Assistance.**

***Index Terms*— Personal safety, real-time alert, location sharing, emergency app, mobile security, Rescue Ready.**

I. INTRODUCTION

In today's fast-transit world, personal security has emerged as a pressure concern, especially for a weak population like women, children and senior citizens. There is an urgent need to develop and deploy innovative, real -time technical solutions that empower individuals to protect themselves and seek immediate help when they are in danger. Despite the significant progress in mobile technology and connectivity, the difference between a person in crisis and immediate support is widespread. Traditional safety measures and law enforcement reactions, though important, often fail to provide timely intervention due to communication intervals, non - availability of real -time information, or lack of accessible equipment in the hands of the victim. This significant interval makes the basis of rescue project. RescueRedy is a smart personal safety mobile application designed to act as an emergency partner, which is capable of sending real-time alerts for pre-defined contacts, shares the exact GPS-based location details, triggers an automated camera to record evidence, and activates a loudness to attract a loudness to record the evidence, and activates a loud dancing by a dancing or using a vigor to attract attention. To detect the alert to be discovered. What separates the protected from many existing solutions is to focus on its automation, speed and a user-centered interface, which requires minimal action during high-stake conditions. By taking advantage of smartphone hardware components such as GPS, camera, microphone and messaging services, the application enables a strong ecosystem of safety features designed to interfere in the most important moments. The importance of such solution is underlined by recent crime data and security reports from global and nationinitiation of assistance. This letter discusses its importance in current security concerns as well as the concept of application, development and testing.

II. LITERATURE SURVEY

The exponential growth in mobile technology has launched a new era of digital solutions aimed at solving complex social challenges. The most pressure of these challenges is the safety and safety of individuals - especially women, children and weaker groups - who face frequent threats of violence, harassment and exploitation. With the availability of smartphones and increasing access to internet services, mobile applications have become a viable and scalable medium to solve this issue. However, despite the abundance of security applications in the market today, a significant analysis suggests that many of these devices are either limited in scope or lacks the necessary strength for real -time crisis management.

This chapter presents a detailed literature survey examining the development, implementation, and effectiveness of existing mobile safety solutions. This attracts both academic research and industrial interest to understand their impact on the development of safety technologies and user welfare. Various dimensions in the review—technical architecture, user experience, purposing environment, emergency response protocols, and privacy concerns—have been explored to provide a comprehensive understanding of what limitations exist. In recent years, the frequency and intensity of gender-based violence and public safety events have significantly increased, highlighted by global organizations such as the World Health Organization (WHO) and national agencies such as the National Crime Records Bureau (NCRB) of India. These alarming figures have triggered an outpouring of innovation in the form of security-oriented mobile applications. While many of these solutions claim to offer real-time alerts and GPS tracking, they also provide audio alarms in a single mobile solution that requires just one tap to activate.

2.2.1 BSAFE The BSAFE app features characteristics such as voice-activated alarms, live streaming, and automatic audio and video recording to enhance personal security. Rich Larsen (2024) discussed rapid emergency reactions with emergency centers and the capabilities of its integration. However, important analyses have expressed concern about lateral monitoring and the potential creation of crime and risk by such apps. For example, a paper published in *Monitoring and Society* examines BSAFE, Citizen, and NextDoor, stating how these platforms can encourage peer monitoring while obscuring the structural elements of crime.

2.2.2 Life360 Life360 is a family-oriented location-sharing app that provides real-time tracking, driving reports, and emergency alerts. While it offers 24/7 emergency remittances and roadside assistance, studies have indicated privacy concerns. A forensic analysis has shown that Life360 users collect and share precise location data, raising questions about privacy. Additionally, discussions in media outlets have highlighted the app's impact on adolescents' social lives, with some arguing that it leads to over-supervision by parents.

2.2.3 My Guardian Developed in 2018 by Fennnaferina Azman, Kistina Suraya, Fiza Abdul Rahim, Muhammad Sufian Mohammed, and Noor Afiza Mohammad Arifin, My Guardian is a personal safety mobile application designed to provide users with emergency assistance features. The app emphasizes quick access to user-friendly interfaces and emergency contacts. The study highlights the importance of such applications in enhancing personal safety, especially for vulnerable individuals population.

III. RESEARCH METHODOLOGY

- The development of Rescue Ready followed a rapid prototype, user response, and a research-driven, iterative process based on user feedback and testing.
- Problem Identification Surveys and informal interviews with students, women, and passengers revealed limitations in current security apps, such as multi-step emergency procedures, deficiencies in evidence collection, and poor performance in low-connectivity areas.
- Requirement Collection: Major functional and non-functional requirements were identified: One-tap emergency warning system, share auto camera and alarm activation, offline SMS alert options, and a simple and fast UI.
- Design and Development Process: The SDLC model adopted included UI mockups and wireframes (XML layout), backend integration with Firebase and SMS manager, Google Live location updates API, and map testing and refinement across several iterations.

3.1 System Requirements

- Platform: Android OS (Minimum API Level 24)
- Development Equipment: Android Studio, Java/Kotlin, Firebase
- Backend: Firebase Realtime Database and Cloud Functions
- API: Google Maps API, SMS Manager, Camera API

3.2 Core features

- Emergency warning: When the Danger button is pressed, the app:

- Captures the user's GPS coordinates, sends an SMS to predefined contacts, starts video recording through the front camera, and activates a loud buzzer to attract nearby attention. The app continuously monitors the user's location and updates the alert system in real-time using Google Maps API and Firebase.
- Camera activation: The front camera of the device starts recording automatically upon emergency activation; the video is stored locally and can be optionally uploaded to the cloud.
- Buzzer alarm: A looping alarm sound is triggered to inform nearby individuals and prevent potential hazards.
- Workflow: The user establishes and registers emergency contacts. Upon pressing the alert button: the location and alert SMS is triggered, the alarm starts echoing, the camera begins recording, and alerts are received by emergency contacts, including a location link (Google Map) and timing information.

IV. SYSTEM ARCHITECTURE AND DESIGN FLOW

"Rescue Ready" follows a modular client-server architecture, mixing a local device sensor (GPS, camera, audio) with cloud-based services (firebase) to provide real-time emergency functionality. The system is designed to reduce the response time and maximize reliability.

4.1 architecture observation The architecture of the app is divided into the following components:

- User Interface (UI): Front-end was developed using Android Studio. "Danger button," emergency contact settings, and live status monitoring.
- Location module: Google Maps uses the fused location provider of API and Android to catch and transmit real -time coordinates. SMS Alert System: SMS sends pre-configured SMS messages automatically to emergency contacts using the SMS manager of the device.
- Multimedia recorder: Alert triggers video recording (through camera 2 API) on activation. Media is locally stored and alternatively syncing in the firebase.
- Alarm Buzzer: A loud siren sound loops until manually rejected or reach the exterior link.
- Cloud Sink (Firebase): Emergency data for review or legal use manages alternative storage of timestamps and media content.

4.2 Design flow diagram

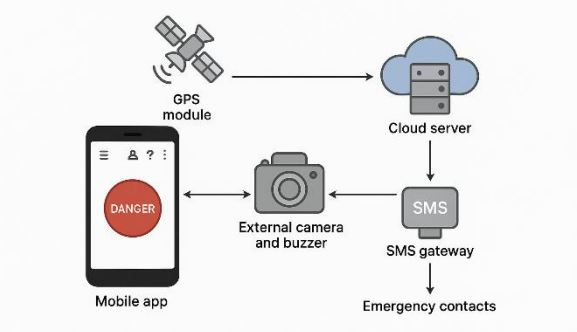

Figure 1.1: RescueReady System Architecture

V. CONCLUSIONS

The Rescue Ready application presents a comprehensive solution to the issue of personal safety pressure, especially for a weak population like women and children. By integrating real-time location tracking, immediate SMS alert, automated video recording and audio alarm in a single, user-friendly interface, the app ensures rapid response during emergency. The modular architecture and use of widely adopted techniques such as firebase and Google Maps APIs contribute to its scalability and reliability. In various scenarios, testing has demonstrated the effectiveness of the app in providing timely assistance, leading to the user increase confidence and safety.

VI. FUTURE ENHACEMENTS

To further enhance rescue abilities, the following promotion is proposed:

- Voice-Activated Emergency Tiger: Including the recognition of voice to activate the emergency protocol, it is beneficial in the conditions where manual activation is not possible.

- Wearable device integration: to allow activation and monitoring of compatibility for discretionary devices (eg, smartwatch).

• AI-based threats detecting: Applying machine learning algorithms to analyze environmental data and user behavior for assessment of forecast danger.

• Multi-language support: Adding support for multiple languages to meet a diverse user base in various fields, ensure access to different fields and purposeful.

• Offline functionality: Increasing the cap capacity of effectively working without internet connectivity, ensuring reliability in areas with poor network coverage.

VII. SECURITY AND PRIVACY CONSIDERATION

Safety and privacy ideas Ensuring user privacy and data security is a main principle behind the design of the preparation prepared application. Since the app is related to sensitive information such as real -time location, contact details and emergency responses, many measures have been applied to protect user data.

6.1 Data Security The application does not store any individual or location data on the outer server. All emergency messages and GPS coordinates are sent directly to pre-set emergency contacts through SMS, bypassing any cloud storage or third-party transmission that may be unsafe for violations.

6.2 Authorization Handling

Deliverance Ready uses runtime warrants on Ready Android to easily request user permission to access the following:

• Position: It's only necessary when the peril button is active.

• Camera and Microphone: Active during an emergency to record the terrain. SMS and contact alerts are completely utilized to send an alert to the designated contact list. These warrants are explained to the user on first use to ensure transparency.

• No Background Data Collection: The app operates only when it starts and doesn't track user activity or collect data in the background. This prevents unnecessary battery drain and maintains user privacy.

• Secure Transmission: Although primary alerts are transmitted through SMS (which doesn't use encryption), there's no transmission of related user data on the cloud server. User control and transparency: users can view, update, or remove their emergency contacts at any time. The app interface is clearly displayed when any module (such as GPS or camera) is active to avoid hidden operations, ensuring a privacy-conscious experience.

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