SMART PHONE BASED WOMEN SAFETY APPLICATION WITH LOCATION TRACKING AND EMERGENCY RESPONSE

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ABSTRACT: The Women Safety Application is a mobile-based solution designed to enhance the personal security of women by providing real-time awareness of potentially unsafe areas. The core objective of this project is to develop an intuitive and accessible application that uses previously recorded data to help users identify and avoid high-risk locations. Through a dynamic safety map that is continuously updated with admin-verified and crowdsourced data, the app allows users or administrators to input information about dangerous areas, including descriptions, latitude, longitude, and notable incident details. With GPS-based location tracking, the application alerts users when they are within a 3-kilometer radius of any marked unsafe zone, allowing them to make informed decisions about their travel routes. In addition to proximity alerts, the application offers a user-friendly interface that can be operated by individuals of all ages, making it widely accessible. Users can choose to reroute or notify emergency contacts when entering potentially risky areas. The platform also fosters community engagement by allowing users to submit safety reports based on personal experiences, thereby contributing to a safer public environment. By combining geolocation features with safety data, the Women Safety Application not only empowers women with situational awareness but also encourages a collaborative approach to public safety. It serves as a dependable real-time safety companion, especially for urban and semi-urban settings where heightened vigilance is essential.

Keywords: Crowdsourced Data, Emergency Alerts, GPS Tracking, Safety Map, Unsafe Areas, Women Security.

I. INTRODUCTION

In recent years, concerns about women's safety have become increasingly significant due to the rising number of incidents related to harassment, assault, and other crimes in both urban and rural areas. While governments and communities continue to take various steps to address these issues, there is a growing need for technology-driven solutions that empower women with tools to protect themselves and make informed decisions about their surroundings. Mobile applications, powered by real-time data and GPS tracking, have emerged as one of the most effective ways to offer immediate assistance and enhance situational awareness. The Women Safety Application is developed with the goal of providing a reliable, user-friendly digital platform that alerts women about unsafe locations in their vicinity. It integrates a dynamic map system that highlights danger zones using data input by administrators and the community. This data includes the latitude, longitude, area names, and descriptions of past incidents, which together help users identify areas that may pose a threat. The application is especially useful in unfamiliar environments where users may not be aware of local safety conditions, offering alerts when they are within a 3-kilometer range of a reported unsafe zone. This system not only works as a preventive safety tool but also fosters community involvement in maintaining a secure environment. Users can actively contribute by reporting new incidents or updating existing records, which are verified by administrators before being reflected in the app. With an easy-to-use interface designed for people of all age groups, the application ensures accessibility and ease of navigation. By combining real-time location tracking, community input, and verified data, the Women Safety Application serves as a vital step forward in leveraging technology to support women's freedom and security in their everyday lives.

Figure 1: Women safety app development

II. RELATED WORK

The literature survey on women's safety emphasizes the crucial role of technology, partnerships, and environmental considerations in enhancing women's security. A key aspect of the research highlights the importance of a supportive work environment for women, as explored by Rodríguez-García et al. (2023). Their study connects the work environment of midwives with women's safety culture, stressing that a positive and supportive setting not only enhances the intent to stay in their professions but also contributes to overall safety practices. This research suggests that fostering a positive work environment and promoting safety culture within communities can play a vital role in improving women's safety. Additionally, the significance of physical activity and its barriers for young adult women is examined by Peng et al. (2023), focusing on how these factors can impact women's safety in both social and physical contexts. Such research emphasizes the role of health and well-being in shaping safety experiences. Further, research by Whitzman, Andrew, and Viswanath (2014) discusses partnerships for women's safety in urban settings. The study underscores the importance of collaborative efforts between governmental bodies, local authorities, and community organizations to address women's safety challenges in city environments. It emphasizes a multi-stakeholder approach that combines resources, knowledge, and community action to create safer urban spaces. This partnership approach helps design policies and interventions that respond to the needs of women, offering integrated solutions to prevent violence and discrimination. This collaborative model has influenced the development of technologies and policies that facilitate safer environments for women, particularly in cities. Additionally, studies by Mandapati, Pamidi, and Ambati (2015) and Yadav et al. (2017) focus on the design and effectiveness of mobile applications dedicated to women's safety. These mobile apps provide real-time alerts, emergency response systems, and location tracking to offer immediate assistance in critical situations. The development of such apps reflects an increasing reliance on technology to address personal security concerns. These systems are particularly effective in urban settings where women may encounter potential threats. The study highlights the role of innovative technologies in promoting women's safety and the positive outcomes of deploying mobile applications as part of a broader strategy to ensure protection and awareness. Integrating machine learning with social media analysis, as in the work of SHANBHAGAM et al. (2024), allows for more advanced, data-driven insights into patterns of safety concerns, offering new possibilities for addressing threats in real time.

III. PROPOSED SYSTEM

The proposed Women Safety Application is a robust and intuitive mobile-based system designed to alert users about potentially unsafe areas using a dynamic map interface. At the core of the system is a real-time location tracking feature that constantly monitors the user's current position. When a user enters a proximity of 3 kilometres to a predefined danger zone, the application automatically triggers an alert notification. These danger zones are determined based on latitude, longitude, area names, and specific incident descriptions stored in the application's secure database. The map interface visually marks these unsafe areas, providing users with spatial awareness and allowing them to make informed decisions, such as avoiding certain routes or informing trusted contacts. In addition to passive alerts, the system offers an interactive platform where administrators can manage and update unsafe locations manually, ensuring data accuracy and relevance. There is also provision for future upgrades where verified users or community members can contribute by submitting reports about new unsafe areas, which would then be reviewed by the admin before being added to the system. The application emphasizes user-friendliness and accessibility, with a clean interface tailored for users of all technical skill levels.

IV. MODULES

1. Interface Creation

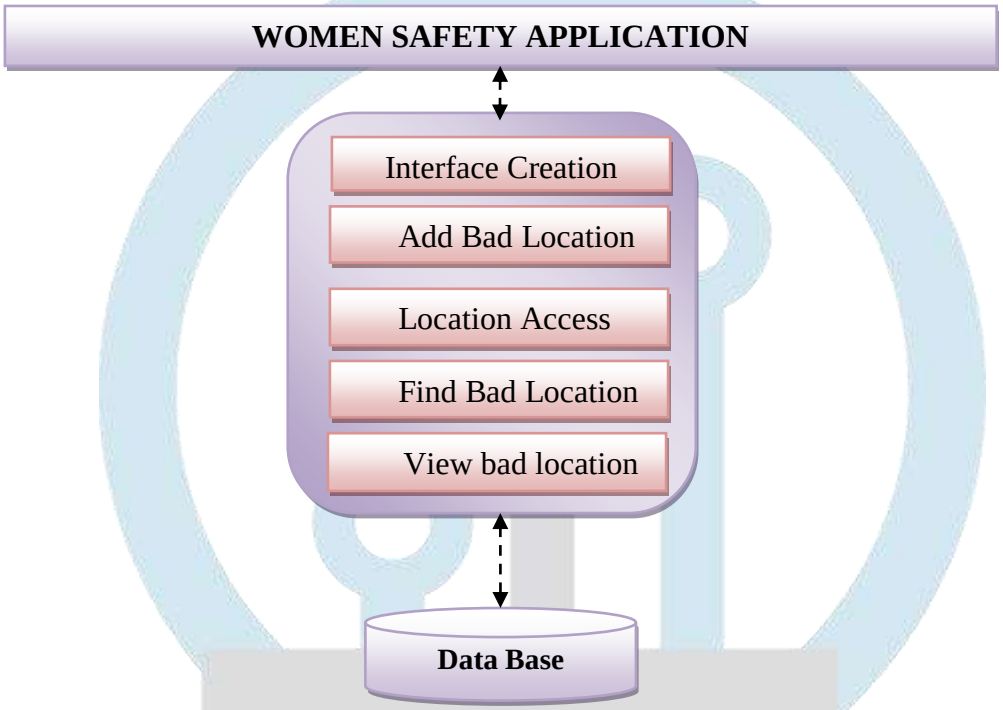
The Interface Creation module focuses on designing a simple and intuitive layout for the Women Safety Application. This ensures that users can easily navigate the app, access essential features like adding bad locations, viewing alerts, and checking safety information. The design is clean and user-friendly, catering to individuals with varying levels of technical expertise. The interface also supports real-time location tracking and dynamic map views. Interactive elements such as buttons and menus enhance the user experience. Overall, this module aims to ensure ease of use and efficient interaction with the app.

2. Add Bad Location

The Add Bad Location module enables users or administrators to input details about unsafe areas or locations. Users can add descriptions, coordinates (latitude and longitude), and the type of hazards observed in the area. This information is stored in the system's database and visually displayed on the safety map for other users. The ability to report dangerous places fosters a community-driven approach to safety. The module ensures that data is accurate and properly formatted for use in real-time alerts. This feature contributes to continuously updating and improving the safety map.

3. Location Access

The Location Access module allows the application to track the user's real-time geographic location using GPS technology. It identifies and records the user's position, enabling the system to assess if the user is near any reported danger zones within a 3-kilometer radius. This feature ensures timely notifications when the user approaches an unsafe area. The module also supports the accurate detection of the user's surroundings, providing essential data to the system. It enables the application to trigger location-based alerts and guidance to steer users away from risks. Real-time location tracking is fundamental to the app's functionality.



4. Find Bad Location

The Find Bad Location module scans the user's environment for unsafe areas within a 3-kilometer radius. It compares the user's current location with the coordinates of previously reported dangerous places. Upon detection of a nearby risk zone, the module immediately notifies the user of potential danger. The unsafe areas are visually displayed on an interactive map for better clarity. This module aids users in making informed decisions about their route, especially when traveling in unfamiliar places. It ensures that users remain alert and are proactive in avoiding high-risk zones.

5. View Bad Location

The View Bad Location module provides users with the ability to access a list of previously reported unsafe areas. The module displays detailed information about each dangerous location, including the description, coordinates, and type of risk observed. An interactive map shows these dangerous locations visually, allowing users to understand their proximity to the risks. The module also allows users to read incident reports or updates on particular locations. It serves as a reference point for users to stay informed about areas with known safety concerns. This module is crucial for users who want to stay updated on safety risks in their surroundings. The figure 2 illustrated the architecture diagram of proposed system.

V. RESULT AND DISCUSSION

The Women Safety Application successfully addresses the critical issue of personal safety for women, particularly in urban and semi-urban environments, by providing real-time information about potentially dangerous areas. The application operates seamlessly by using GPS technology to track users' locations and alert them when they are near any marked unsafe zones within a 3-kilometer radius. The system's ability to collect and display user-contributed data, as well as information validated by administrators, creates an up-to-date and accurate safety map that helps users make informed decisions about their routes. The intuitive interface ensures that users, regardless of technical proficiency, can easily access and navigate the app's features, such as location tracking, safety alerts, and reporting dangerous areas. Through the inclusion of community-driven data, the app also fosters a sense of shared responsibility and collective vigilance, making the system more robust and reliable. The application's impact on women's safety is significant, as it enhances real-time awareness and encourages proactive decision-making. In areas where safety concerns are prevalent, users can feel more confident when traveling alone, especially during late hours

or in unfamiliar areas. The system's ability to provide instant alerts and suggest alternative routes ensures that women can avoid high-risk locations and take timely action in case of emergencies. Moreover, the application's feature that allows users to report unsafe areas empowers individuals to contribute to a safer environment for others, creating a supportive community of users looking out for one another. Overall, the Women Safety Application proves to be an effective tool in enhancing women's safety, promoting social awareness, and encouraging the use of technology for public well-being.

VI. CONCLUSION

The Women Safety Application provides an effective and innovative solution to a growing societal issue by leveraging technology to enhance personal security. By integrating real-time geolocation tracking, user-contributed data, and proactive safety alerts, the application ensures that women can navigate their surroundings with a greater sense of security. The system's ability to report and view unsafe areas in real time not only empowers users to make informed decisions but also fosters a community-driven effort to address safety concerns. Its user-friendly interface and practical features make it accessible to a wide range of individuals, offering peace of mind, particularly in high-risk environments. Overall, the application has proven to be an essential tool in enhancing the safety of women, providing both immediate protection and long-term value through continuous updates and user contributions. While the system is already effective, future improvements, such as integrating AI for predictive threat analysis and collaborating with local authorities for quicker responses, could further enhance its capabilities. The Women Safety Application has the potential to make a significant impact in improving public safety, promoting awareness, and encouraging proactive actions within communities to ensure the well-being of individuals.

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