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SHAKTI MITRA: A MOBILE SOLUTION FOR ENHANCING WOMEN'S SAFETY

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Abstract: Women's safety is an important issue as many face harassment, violence, and threats in both public and private places. It's not just about handling emergencies but also about creating a safe environment where women can live without fear. With rising crimes against women, reliable safety measures are needed more than ever. Technology has become a helpful tool in solving this problem. Mobile apps designed for women's safety work like virtual guardians, offering features such as real-time communication, live location sharing, and emergency alerts. GPS tracking helps women stay aware of their surroundings, while tools like panic buttons allow them to call for help quickly. Advanced features like machine learning and geolocation also help identify risky areas and give safety tips. These apps not only make responses faster but also give women more confidence to move freely and make safe choices. By combining technology with safety systems, these apps become accessible to many people and play a big role in creating a safer society. Developing women's safety apps is an important step toward helping women feel secure and independent, reducing risks, and making the world a safer place for everyone.

Keywords: Panic button, Real-time tracking, Risk prevention, Location sharing, Proactive alerts.

I. INTRODUCTION

Women's safety is an ongoing concern worldwide. Across the globe, women face threats like harassment, violence, and abuse, both in public and private spaces. These safety issues not only affect a woman's physical health but also impact her mental well-being, freedom, and independence. Many women, regardless of where they live, experience fear and anxiety when navigating public spaces, traveling alone, or even within their own homes. This fear restricts their ability to pursue their goals, whether it's attending school, going to work, or simply enjoying daily activities. As crimes against

women continue to rise, the need for effective, immediate, and reliable safety measures has never been more urgent.

Traditional methods of ensuring safety, such as law enforcement or public awareness campaigns, often fail to provide women with the immediate assistance they need during emergencies. Response times are often delayed, and these methods typically address the issue after the fact, leaving women vulnerable when they need help most. This gap in emergency response calls for a new, proactive approach to women's safety, one that empowers women to feel confident and secure in their daily lives.

In today's digital age, technology has proven to be a powerful tool in addressing many challenges, including safety. The advent of smartphones and mobile applications has introduced new ways to help individuals protect themselves in real-time. For women, mobile safety apps have emerged as an essential tool, offering features such as instant emergency alerts, real-time location sharing, and access to support networks, all at the touch of a button. By integrating these technologies, women are given a means to feel more secure, no matter where they are or what situation they find themselves in.

Shakti Mitra is an example of such an innovative solution, designed specifically to address the growing concerns of women's safety. This app incorporates features like a panic button that sends alerts to emergency contacts, real-time GPS tracking for location sharing, and a safety map that helps women avoid high-risk areas. These features work together to create a safer environment for women by ensuring they have the support they need in case of emergencies. The app's predictive risk mapping, powered by real-time data, allows women to assess potential dangers in their surroundings and make informed decisions about where to go.

In addition to these features, Shakti Mitra emphasizes user privacy and security. It ensures that personal data is encrypted and protected, while still providing accessible tools to enhance safety. Whether in an urban city or a rural



area, Shakti Mitra aims to be a solution that can be accessed and trusted by women everywhere. By using mobile technology, Shakti Mitra allows women to take control of their own safety, knowing that help is just a click away. Technology has the power to transform safety solutions, making them faster, more reliable, and easily accessible. By combining features like real-time tracking, emergency alerts, and predictive mapping, Shakti Mitra is a comprehensive tool that provides peace of mind and empowers women to feel more secure in their everyday lives. The integration of technology into personal safety is an essential step in ensuring that women can live freely, confidently, and without fear.

1.1 Literature Review

The review of existing literature revealed various efforts to develop mobile applications for women's safety, each addressing specific aspects of this critical issue.

The NAARI app by Harshitha et al. [1] (2021) incorporated Android and GSM technologies to provide safety alerts and tracking. However, it lacked predictive analytics for identifying potential threats.

Sankar et al. [2] (2022) proposed an app focused on real-time location sharing and emergency notifications, yet it lacked features such as location-based safety tips and multimedia communication.

Ayush et al. [3] (2023) emphasized live tracking and SOS alerts but offered limited exploration of predictive analytics for enhancing women's safety.

Another solution by Prof. Aditi Patil et al. [4] (2023) integrated GPS and Java for a safety app targeting women but had gaps in integrating law enforcement with the app's response mechanism.

The Women Safety App by Sakure et al. [5] (2022) combined GPS technology with Android development to offer features like real-time location tracking, SOS alerts, sirens, and voice recording for evidence collection. However, it lacked advanced integration with predictive analytics and wearable technologies, limiting its proactive safety measures and user accessibility in critical situations.

Sarma et al. [6] (2023) developed an Android-based women safety app that integrates features such as real-time GPS tracking, nearest police station detection using the Haversine formula, and connectivity with social media platforms like WhatsApp for broadcasting emergency statuses. However, the app lacks predictive analytics for identifying high-risk areas and automated response mechanisms during device inaccessibility, leaving gaps in ensuring comprehensive safety solutions for users.

The My Safetipin Mobile Application by Manazir et al. [7] (2019) uses GPS technology to show safety scores for locations, allow safety audits, and suggest safer routes. It also has features like tracking friends in unsafe areas. However, the app has issues like technical bugs, limited

language options, and poor reach to women in rural and urban areas. Problems with user data safety and lack of clear tutorials also make it less helpful for improving women's safety.

The WoS App by Bhanushali et al. [8] (2018) allows women to send location updates to police and emergency contacts by pressing the power button twice. It works offline and provides continuous location tracking, but lacks advanced wearable integration.

The Women Security **System** by Akuskar et al. [9] (2018) is a safety device with an SOS button that triggers alarms, gives an electric shock for self-defense, and tracks location using GPS. It sends emergency messages to three contacts and the police to provide quick help. The device is small, affordable, and easy to use, helping women feel safer in public spaces.

The Women Safety App by Kopanati et al. [10] (2024) uses machine learning to detect danger through sound patterns and triggers alerts, location sharing, and audio-video recording. It helps women stay safe by providing features like emergency contact notifications and nearby safe places.

These studies collectively highlight significant progress in women's safety technology but underscore the need for a comprehensive app with advanced analytics, real-time tracking, emergency communication, and robust integration with law enforcement, which our proposed solution aims to address.

II. METHODOLOGY

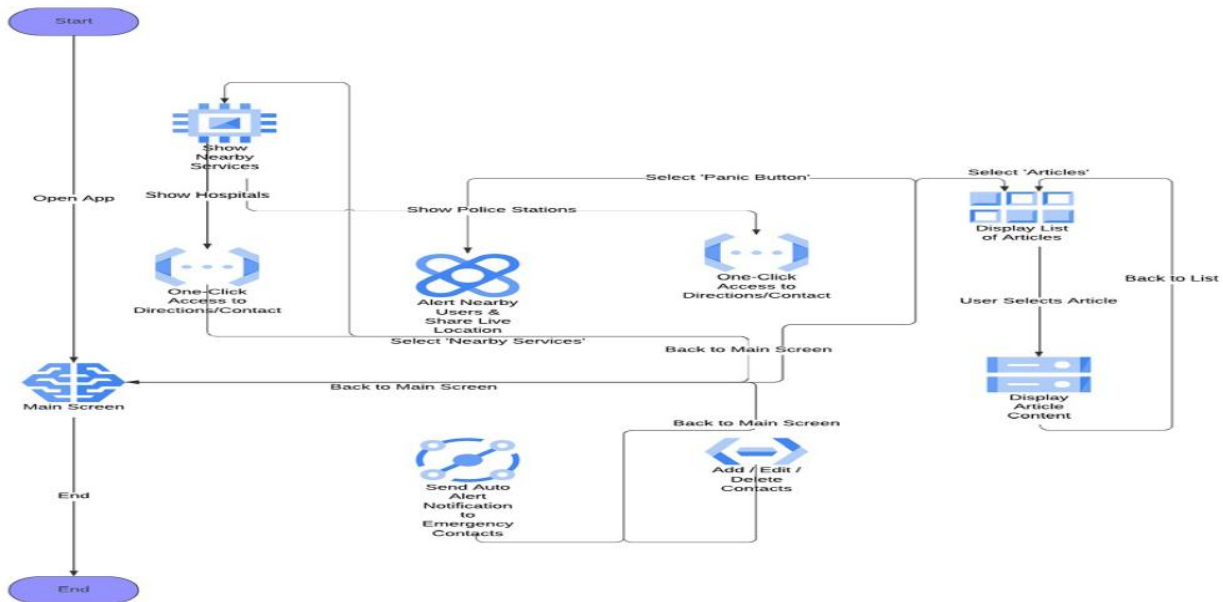
The development of the Shakti Mitra app followed a well-planned process to ensure it was effective, user-friendly, and secure. The app was designed to help users during emergencies by providing essential features like instant alerts and live location sharing. The frontend of the app, which is what users see and interact with, was created using Flutter. This technology was chosen because it allows the app to work smoothly on both Android and iOS devices, giving a consistent experience to users. For managing data and backend processes, Firebase was used. Firebase provides fast and reliable data storage, making it easy to handle tasks like saving user profiles and emergency contact details. In addition, JavaScript was used to handle some of the logic for processing user inputs and managing alerts.

The app includes several important features designed to enhance women's safety. The panic button allows users to send an instant alert to their trusted emergency contacts with one click. The app also includes a live location tracking feature, which helps in sharing the user's location in real time so their contacts can quickly locate them in an emergency. Users can also create and manage their profiles within the app, where they can save personal information and emergency contacts.

The working of the app is straightforward and efficient. When a user interacts with the app, such as pressing the

panic button or updating their profile, the Flutter frontend sends the user's actions to the backend. The backend processes the request, stores or retrieves the required data from Firebase, and then performs the necessary actions, like sending alerts or updating the location. The connection between these components ensures smooth and reliable functioning during emergencies. To make this process easy to understand, a flowchart has been included in this section, showing the step-by-step working of the app.

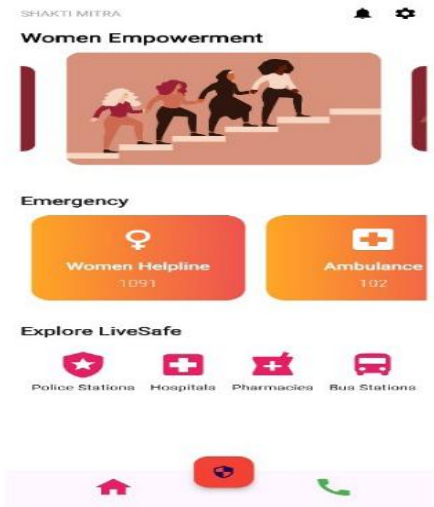
To ensure the app is secure and user-friendly, various measures were implemented. User data, such as profiles and emergency contact details, is stored safely in the Firebase database. Access to this data is restricted, ensuring that only authorized users can view or update it. Additionally, every feature was carefully tested to ensure it works as expected and that the app performs well under different conditions.



III. RESULTS AND DISCUSSION

Key features of the **Shakti Mitra** app include:

1. **Main Screen:** Simple and intuitive layout for easy navigation in emergencies.



2. **Nearby Services with Geolocation:** One-click access to hospitals and police stations.

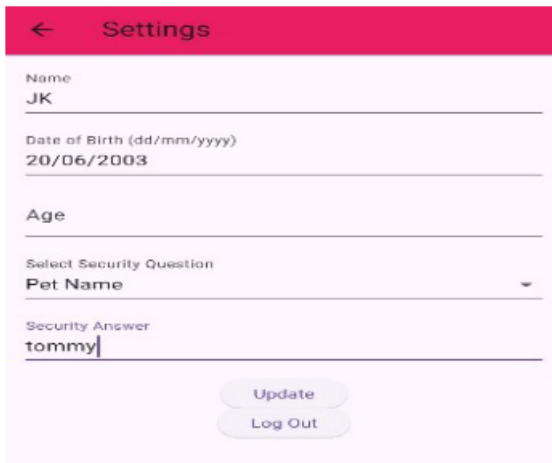
3. **Panic Button for Real-Time Alerts:** Allows users to alert trusted contacts and share their live location.

4. **Educational Resources:** Safety and emergency preparedness articles.

5. **Emergency Contact Management:** Users can add/edit contacts, with automated alerts for critical situations.

6. **User-Friendly Design:** Focus on **low cognitive load** for smooth navigation under stress.





IV. CONCLUSION AND FUTURE SCOPE

The Shakti Mitra app was created to help improve personal safety, especially for women, during emergencies. It includes features like a panic button, live location sharing, a map showing risky areas, and the ability to manage user profiles. These features allow users to quickly get help and stay connected with their trusted contacts in emergencies, giving them a sense of security. The app empowers people to take control of their safety.

In the future, the app can be made even better. For example, adding voice commands will allow users to activate safety features without touching their phone. The app can also work with wearable devices like smartwatches to make it even faster and easier to use. Adding support for different languages can help more people use the app. The app could also collaborate with local authorities, such as police or emergency services, to provide quicker help in emergencies. Features like community-based safety alerts can create a stronger network of safety, helping more people stay safe. These improvements will make the app more helpful and adaptable to changing safety needs, ensuring it continues to serve users effectively.

V. ACKNOWLEDGMENTS

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