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Amaan: A Shield for Women: A mobile Application with SOS Built in Feature

Sarthak Pagar[1], Tinish Uge[2], Nikita Sawant[3], Jitendra Gaikwad[4]
Vishwakarma Institute of Technology, Pune

Abstract: ***This paper delves into the development and implementation of "Raksha," an innovative Women's Safety App designed to enhance personal security and provide quick access to emergency assistance and to address the critical issue of women's safety in various situations. The app incorporates advanced features such as "Get Home Safe," "Safe Shake," and a comprehensive directory of helplines. Developed using Flutter and the DART programming language, the app aims to empower women with tools that ensure their safety in various situations. This report outlines the methodology, tools, and technologies used in the development process, along with the app's key features. Additionally, the results and discussions highlight the effectiveness of Raksha in promoting women's safety, and the paper concludes with future scope and potential enhancements.***
Keywords: Women's Safety, Mobile Application, Safety Features, Flutter, Figma, Emergency Alerts, Helplines, User-Friendly Design.

I. INTRODUCTION

In today's world, ensuring the safety of women has become a critical concern. Traditional safety methods often prove insufficient, necessitating innovative solutions. In an era where technology intertwines with every aspect of our lives, leveraging its power to ensure personal safety has become an imperative concern, especially for women. Addressing this need, we present "Raksha," a cutting-edge women's safety app meticulously designed to empower users with a comprehensive suite of features aimed at enhancing security and providing swift access to emergency assistance. The contemporary landscape has witnessed a surge in the recognition of the challenges women face concerning personal safety. This app's core features exemplify its commitment to women's safety. The "Get Home Safe" feature is not just a tracking mechanism but a proactive tool that allows users to set a specific time for reaching their destination. Should they not arrive by the designated time, the app automatically initiates location tracking and alerts emergency contacts. This feature transforms the app into a virtual companion, ensuring that help is readily available when needed. In the event of an emergency, the "Safe Shake" feature offers a discreet and immediate method of sending SOS alerts, even if the app is closed. This innovative approach to seeking help can be a game-changer in situations where time is of the essence.This app embraces an approach to women's safety. From providing safety tips for various situations to recommending safer routes based on real-time data, the app transcends the conventional boundaries of safety applications. Community alerts and one-touch SOS functionalities foster community engagement and expedite emergency response times.

II. LITERATURE REVIEW

[1]The literature surrounding women's safety concerns, particularly in regions like India, underscores the pressing need for innovative solutions to enhance the responsiveness of law enforcement agencies. The paper titled "A Mobile Application for Women's Safety: WoSApp" addresses this issue by introducing a novel approach to triggering emergency calls through a mobile application. The primary challenge identified is the delayed response of the police to distress calls, a hurdle attributed to various constraints. WoSApp tackles this by providing users with discrete methods, such as shaking the phone or pressing a PANIC button, to activate the calling function swiftly. The paper further highlights the immediate transmission of critical information, including the user's geographical location and contact details of pre-selected emergency contacts, directly to the police. The literature review underscores the significance of leveraging technology to address women's safety concerns, emphasizing the potential impact of WoSApp in facilitating faster and more efficient emergency response. The application was likely built using a mobile app development framework such as React Native or Flutter, allowing for cross-platform compatibility and efficient development. The integration of GPS technology played a pivotal role in enabling the accurate tracking of the user's geographical location, a crucial feature for emergency response. Additionally, the application likely employed secure communication protocols to transmit sensitive information to the police, ensuring data integrity and privacy. The user interface design may have been crafted using design tools like Adobe XD or Sketch to ensure an intuitive and user-friendly experience.

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[2] This paper introduces a valuable contribution to women's safety by presenting a user-friendly Android application. The core functionality of the app centers around a single-click activation, allowing users to quickly communicate their distress and location to registered contacts. The integration of GPS technology facilitates accurate location tracking, and the automatic transmission of location information through SMS to registered contacts enhances the efficiency of emergency response efforts. A notable feature is the continuous update of location details every five minutes until the user stops the process, providing a real-time and dynamic tracking mechanism. The three-step evaluation process outlined in the paper ensures a comprehensive understanding of the app's functionality, starting with the input of contact details during the initial installation. The second step involves the seamless transmission of GPS information to registered contacts when the rescue button is activated, contingent on proper mobile network connectivity and GPS settings. Overall, ABHAYA addresses the pressing need for swift and effective response mechanisms in times of danger, presenting a well-rounded solution that leverages technology to enhance the safety of women. The paper provides a clear and systematic overview of the app's development and functionality, contributing meaningfully to the discourse on leveraging technology for women's safety.

[3] "SHIELD: Application for Personal Security" is, as the name implies, an application that shields, protects, saves, and defends oneself from harm. It sends an immediate message with the device's position to all registered contacts, allowing for live tracking of the woman's whereabouts and the provision of necessary aid. The system's primary functionality is based on location tracking.

It is fully dependent on GPS position monitoring and real-time site updates. SHIELD determines and updates the website in real-time changes in the user area. Depending on the internet connection, the update shows on the website within 0.5 seconds.

III. FEATURES

A. Get Home Safe

This feature allows users to set a specific time. If they do not reach their destination by that time, the app will automatically track their location and send alerts to their emergency contacts.

B. Safe Shake

In case of an emergency, users can simply shake their mobile device to send SOS alerts, even if the app is closed. This feature ensures quick access to help when it's needed most.

C. Helplines

The app provides a directory of important contact information, including nearest police stations, hospitals, fire brigades, pharmacies, and more. Users can easily access these numbers in times of need.

D. Safety Tips

Providing useful safety advice and tips for different situations.

E. Safe Routes

Recommending safer routes to users based on real-time data.

F. Community Alerts

Allowing users to report and share safety-related incidents with the community.

G. Emergency Contacts

Storing and managing emergency contact details.

H. One-Touch SOS

Enabling users to send SOS alerts with a single button press.

IV. METHODOLOGY/ IMPLEMENTATION

A. Technology

1) *Flutter:* For development of this app Flutter is chosen as the development framework due to its cross-platform compatibility, allowing the app to run seamlessly on both Android and iOS devices.

2) *DART:* The DART programming language, known for its efficiency and compatibility with Flutter, is selected to implement the app's functionality.
3) *Figma:* Figma is employed for designing the user interface, ensuring a visually appealing and intuitive experience.
4) *Android Studio:* Android Studio was utilized as the integrated development environment (IDE) for the Raksha project. As a powerful IDE specifically designed for Android development, it provided a robust environment for coding, testing, and debugging the app.

Android Studio integrated seamlessly with the Flutter framework, offering a dedicated platform for Android development. It facilitated the testing of the Raksha app on Android devices, ensuring compatibility and optimal performance.

B. Implementation

In the feature implementation phase, the "Get Home Safe" functionality underwent a meticulous process. Flutter's geolocation plugin was employed to access the device's location, facilitating the implementation of background location tracking to monitor the user's progress. A notification system was set up to prompt users to establish a specific arrival time. Upon the elapse of the set time, location tracking was initiated, and alerts were sent if the user hadn't reached their destination, enhancing user safety through timely notifications. The "Safe Shake" feature was brought to fruition by utilizing Flutter's motion sensors plugin to detect device shakes.
Addressing emergency situations, the helpline functionality involved creating a comprehensive database of emergency contacts using Flutter's local storage capabilities. An intuitive user interface was implemented to access and display helpline information, and Flutter's communication plugins facilitated direct calls to emergency contacts.User interface design was a collaborative effort, utilizing Figma for wireframes and visual elements. Design elements were seamlessly converted into Flutter widgets to ensure a responsive and intuitive interface aligned with the app's safety-focused objectives. Communication APIs played a crucial role in enabling SMS alerts and emergency calls. Robust error handling and fallback mechanisms were implemented to ensure reliable communication in various scenarios. Thorough testing of communication features was conducted to guarantee swift and accurate response times, emphasizing the app's commitment to effective communication in emergency situations.

V. RESULTS AND DISCUSSIONS

The implementation of the Raksha women's safety app has demonstrated a resounding success, achieving seamless integration and functionality across its key features. The "Get Home Safe" feature, exhibited precise background location tracking, seamlessly initiating automated alerts when users failed to reach their destination within the designated timeframe. This proactive safety mechanism has proven effective in providing users with a vigilant digital companion during their journeys. The comprehensive nature of the SOS alerts, including relevant user information and precise location details, underscores the app's commitment to rapid and informed emergency response. The helpline directory feature, crafted through Flutter's local storage capabilities, manifested as a user-friendly and efficient tool. The comprehensive emergency contact database, coupled with an intuitive interface and search functionality, allows users quick access to vital helpline numbers. This streamlined approach ensures that users can swiftly connect with essential services in times of need. The synergy between these features highlights the success of the chosen technology stack—Flutter, DART, Figma, and Android Studio—wherein the cross-platform compatibility, efficient coding, and collaborative design capabilities contributed significantly to the overall success of Raksha.

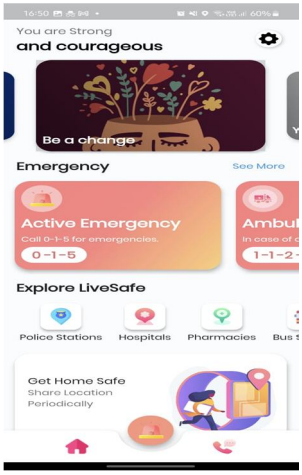


Fig.1 Screenshot of Home activity.

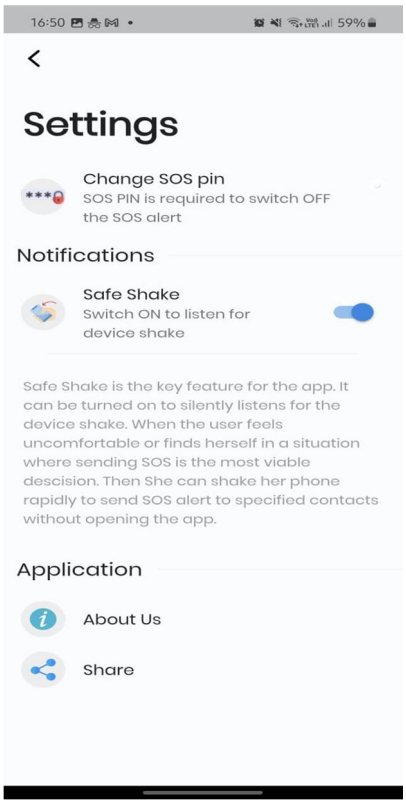


Fig.2 Screenshot of Safe Shake option

“Fig.2” "Safe Shake" functionality, utilizing Flutter's motion sensors plugin, showcased exceptional responsiveness and background monitoring, ensuring that users can discreetly trigger SOS alerts even when the app is closed.

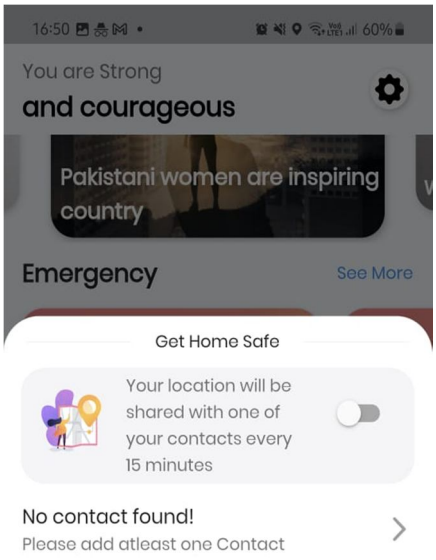


Fig.3 Add Contact Feature

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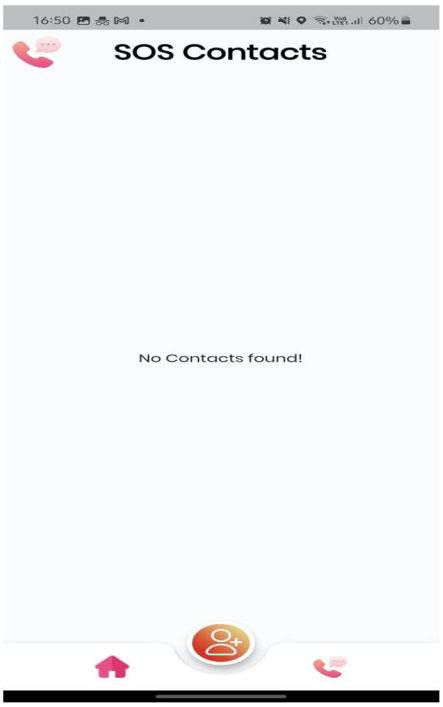


Fig.4 Contacts stored in the app

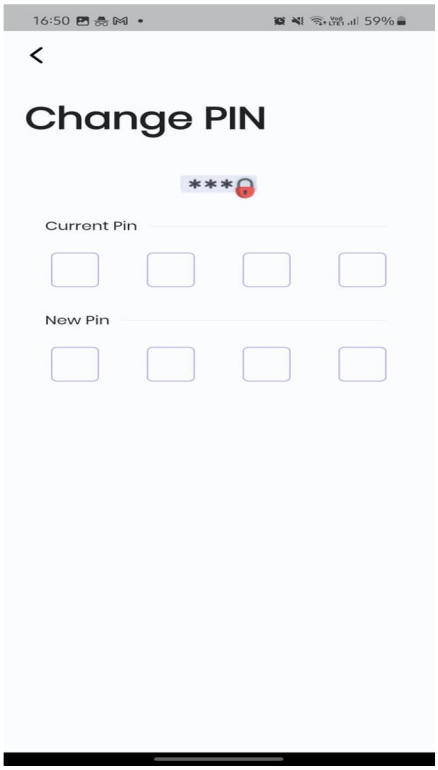


Fig.5 Change pin option

The implementation encompassed a feature allowing users to change their app PIN for enhanced security. Flutter's capabilities were utilized to create a secure and straightforward process for users to modify their PIN within the app settings. This functionality added an extra layer of personalization and security, ensuring that users could easily manage access to their safety information.

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VI. FUTURE SCOPE

A. Voice-Activated SOS

The implementation of voice recognition technology will enable users to activate SOS alerts hands-free, adding a new dimension of accessibility and discretion to the Raksha app.

B. Live Video Streaming

Future iterations will introduce a live video streaming feature, allowing users to share real-time visuals with their emergency contacts during critical situations. This enhancement aims to enhance situational awareness for both users and responders.

C. Geo-Fencing and Safe Zones

The addition of geo-fencing capabilities will empower users to define safe zones, with Raksha sending alerts if the user enters or exits predefined areas. This feature provides an extra layer of location-based safety.

D. Wearable Device Integration

Future updates will explore the integration of Raksha with wearable devices, enabling users to access key features directly from their smartwatches or other wearable gadgets.

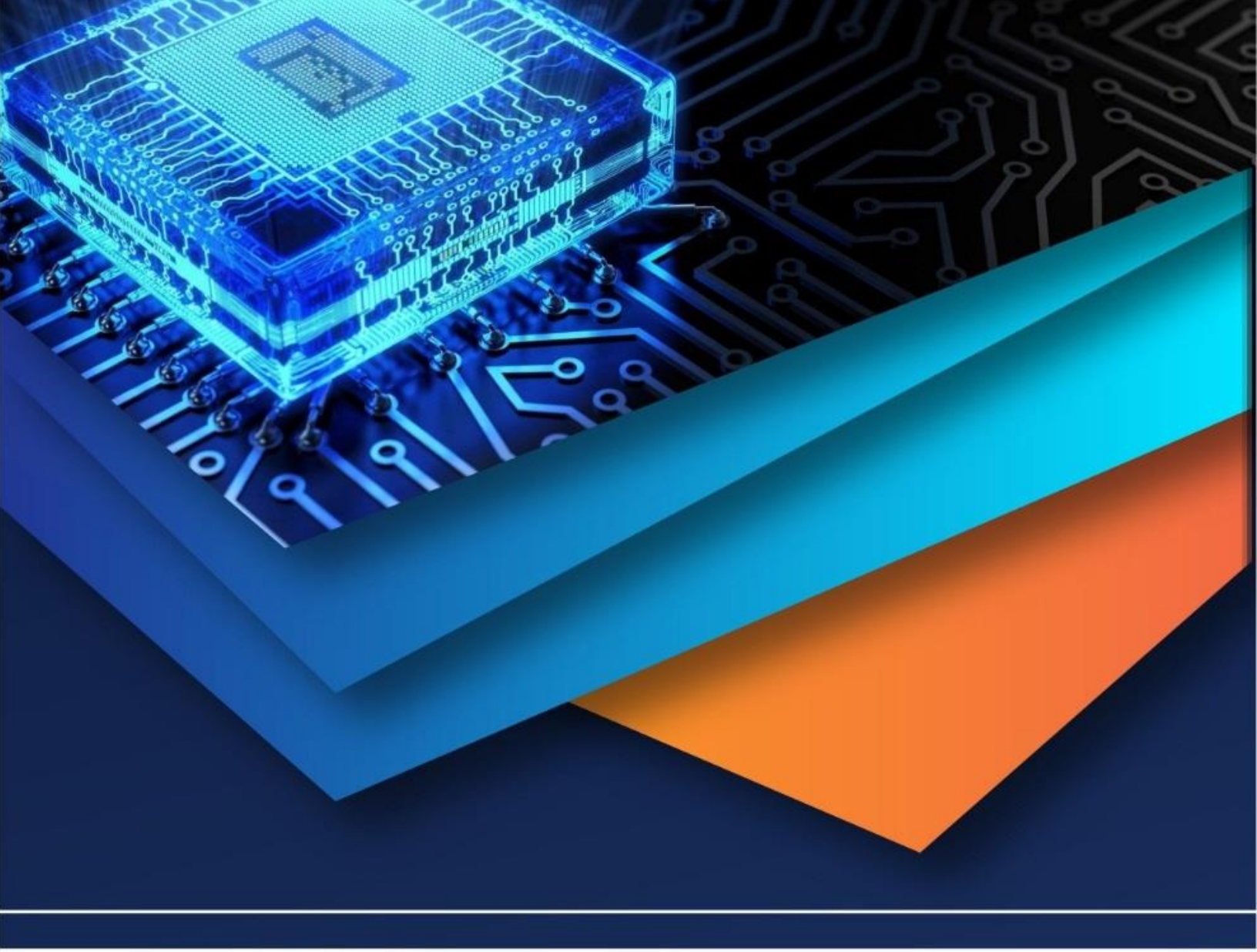
VII. CONCLUSION

In the culmination of the Raksha women's safety app, the successful implementation of advanced features and a robust technology stack has realized a comprehensive solution for enhancing women's safety. The app's success is evident in its key functionalities, and the streamlined helpline directory. The impact of Raksha extends beyond the technological aspects, representing a commitment to leveraging innovation for the betterment of society. As a user-friendly and reliable application, Raksha stands as a beacon in the realm of women's safety, addressing diverse safety needs through cutting-edge technology.

Looking ahead, Raksha holds promise for continued refinement and innovation. Future iterations could explore integrating emerging technologies,and expanding features based on user feedback. The success of Raksha underscores the potential of technology to contribute meaningfully to the safety and well-being of women globally.

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