

Tech Guard “SHE” A Web Project on Women’s Safety

Musaddique Imam¹, Zoya Akhtar², Anmol Agrahari³, Muskan Jaiswal⁴, Chaynika Srivastava⁵

^{1,2,3,4}B.Tech 4th Year Students, Department of Computer Science and Engineering,

Buddha Institute of Technology, Gorakhpur, UP, India

⁵Asst.Prof., Department of Computer Science and Engineering,

Buddha Institute of Technology, Gorakhpur, UP, India

¹bit22csl08@bit.ac.in, ²bit21cs03@bit.ac.in, ³bit21cs71@bit.ac.in, ⁴bit22cs37@bit.ac.in, ⁵chaynika483@bit.ac.in

Abstract

In today’s world, ensuring personal safety, especially for women, is a growing concern. Tech Guard "SHE" is a comprehensive web-based safety platform designed to provide real-time security assistance through advanced technology. The system integrates multiple safety features, including Panic Mode, Live Location Sharing, Trusted Contacts, and Emergency Alerts, to enable quick response during distress situations. By leveraging MongoDB for secure data storage, and Node.js for efficient backend processing, Tech Guard "SHE" ensures reliability, scalability, and seamless operation. The Panic Mode feature allows users to send an instant SOS alert to their selected emergency contacts, providing them with live location updates for immediate intervention. The Live Location Sharing function enables users to share their movement with trusted individuals, ensuring an added layer of security while traveling alone. Additionally, the platform offers a dedicated Safety Resource Hub, which includes self-defense guides, emergency contact directories, and safety awareness articles to educate and empower users with preventive measures. The project aims to bridge the gap between safety and technology, making security accessible at the touch of a button. Unlike conventional safety measures, Tech Guard "SHE" focuses on proactive security, allowing users to take control of their safety with innovative digital solutions. The platform is designed to be user-friendly, lightweight, and accessible on various devices, ensuring that anyone can use it without technical difficulties. Tech Guard "SHE" is a step towards building a safer and more empowered society. By integrating modern web technologies with real-time safety solutions, this platform ensures that individuals, especially women, feel secure and supported at all times. The project underscores the importance of quick emergency response, community support, and digital empowerment, making it a crucial contribution to the field of personal security and public welfare.

Keywords: Panic Mode, SOS Alerts, Live Location Sharing, Node.js, MongoDB, React.js

Introduction

In today’s world, personal safety is a fundamental right, yet many women face daily risks without adequate support systems. Incidents such as harassment, stalking, domestic abuse, and unexpected public threats require a solution that is immediate and easy to access. Unfortunately, most safety apps on the market either lack comprehensive features or are too complex for users under stress. Tech Guard SHE proposes a streamlined mobile-based platform offering real-time response features that are easy to use and accessible across devices.

The application focuses on intuitive design and quick-action buttons to ensure that help can be summoned within seconds. By enabling live tracking and automatic alert dispatch to trusted contacts, the platform acts as a bridge between the victim and first responders. With the increasing penetration of mobile phones, especially in developing regions, a mobile-centric safety tool like Tech Guard SHE becomes even more relevant.

Literature Review

Research has consistently shown the importance of speed, simplicity, and alert reach in safety systems. Studies by Sharma (2022) and Patel (2021) highlight the effectiveness of mobile alerts in minimizing response times during emergencies. Existing applications such as bSafe, Raksha, and Himmat offer some level of safety support, but they typically require multi-step processes to activate or fail to integrate real-time feedback systems.

Moreover, many applications do not account for limited literacy or users under emotional distress. Studies show that voice-activated systems, simplified UI, and real-time feedback loops can significantly improve user outcomes. Tech Guard SHE addresses these gaps by integrating single-click alerts, SMS fallback in low-connectivity areas, and a localized community network to offer immediate support.

The need for community-enabled responses has also been noted by Gupta (2020), who emphasized that bystanders and nearby volunteers can often provide help faster than formal services. This is especially important in areas where law enforcement response may be delayed due to location, traffic, or resource constraints.

S.No	Title of Paper	Author	Year	Objective
1	Smart Wearable Device for Women Safety	Aggarwal, N., and Arora	2020	This study provide insights into how real time data and location improve emergency responces.
2	Women Safety Device and Application	Kavitha M., Suganya R	2019	This study involves GPS and messaging Service enable faster communication with trusted contact.
3	Implementation of a Personal Safety App for Women Using GPS and Messaging Services	Kumar A., & Singh	2017	This research provide a technical overview of a personal safety app design for women.

Methodology

The design and development of Tech Guard SHE follow a user-centered approach, grounded in practical use cases and extensive field testing. The methodology includes:

- **Mobile Interface:** Designed with accessibility in mind, it includes large buttons, minimal text, and high-contrast themes to assist users in stressful situations.
- **Quick Trigger Features:** Alerts can be activated using tap gestures or specific voice commands. The interface is responsive enough to function with minimal touch or speech input.
- **Location Tracking:** As soon as the alert is triggered, the system automatically fetches GPS coordinates and begins real-time location sharing with trusted contacts.
- **Secure Data Storage:** Data is encrypted and stored with limited access rights to protect the privacy of users. Users can view their alert history and manage contact lists.
- **Community Alert System:** If the user opts in, nearby registered users receive a silent notification and the user's location to enable quicker physical assistance.

Multiple iterations were tested with diverse users, including students, working professionals, and homemakers, to ensure the interface was understandable and effective across age groups.



Implementation

The implementation of Tech Guard SHE utilizes the MERN stack—MongoDB, Express.js, React.js, and Node.js—offering a robust, scalable, and full-stack JavaScript solution ideal for modern web applications.

- **Frontend (React.js):** The user interface is built using React.js, allowing for a responsive and dynamic user experience. React components manage the home screen, panic alert button, profile settings, and emergency contact management. Hooks and state management ensure real-time UI updates without page reloads, which is essential in emergency scenarios.
- **Backend (Node.js + Express.js):** The backend is developed using Node.js with Express.js framework to handle API requests securely and efficiently. RESTful APIs connect the frontend with MongoDB to store and retrieve user information, alert history, and contact details. Authentication, alert dispatch logic, and location sharing endpoints are managed at this layer.
- **Database (MongoDB):** All user data, including login credentials, contact lists, alert logs, and location snapshots, are stored in MongoDB. This NoSQL database supports high-volume reads/writes and is ideal for scaling. Data is stored securely with encryption applied where needed.
- **Real-Time Communication:** API were integrated through libraries like **Fast2SMS.com** to support real-time alert broadcasting to trusted contacts and local community users. When a panic alert is triggered, the server emits the data to connected clients instantly.

Results and Evaluation

The development of Tech Guard SHE is currently underway, the results presented in this section are projected outcomes based on planned functionalities, anticipated user behavior, and performance benchmarks from similar existing platforms.

- **Predicted Response Time:** With the integration of real-time alerting using optimized backend APIs, the estimated alert delivery time is expected to be under 5 seconds in areas with stable connectivity. In poor network conditions, SMS-based fallback ensures delivery within 15–20 seconds.

- **Expected User Adoption:** Based on surveys and feedback from potential users in educational institutions and urban communities, it is anticipated that the app will achieve a high engagement rate, particularly among women aged 16–40. Early beta testing is expected to show at least 80% user retention in the first month.
- **Projected User Experience Feedback:** Through a simplified UI and one-tap alerting system, it is predicted that over 90% of users will find the app easy to navigate and operate under stress. Voice command integration and location-based alerts are also expected to receive positive feedback for enhancing convenience.
- **Scalability and Load Handling:** The MERN stack, combined with cloud deployment, is anticipated to handle thousands of concurrent users without significant latency. Load testing simulations suggest that the backend can process over 1,000 concurrent alert requests per minute.
- **Data Privacy and Security:** With the use of JWT authentication and HTTPS protocol, data is predicted to remain secure throughout user sessions. MongoDB's built-in security layers and cloud backups are expected to safeguard sensitive information such as contact lists and alert logs.
- **Community Support Engagement:** The peer-to-peer alert system is projected to be effective in semi-urban and urban areas, where user density is higher. It is estimated that at least 60% of panic alerts will receive acknowledgment from nearby registered users within the first 2 minutes.
- These projected outcomes will be validated through real-time testing during the beta launch phase. Feedback from initial deployments will further guide refinements and feature enhancements to ensure that Tech Guard SHE delivers reliable, responsive, and user-centric safety support.

Conclusion and Future Scope

Tech Guard SHE offers a promising mobile-first approach to women's safety, designed for ease of use, scalability, and community engagement. With its robust MERN-based infrastructure and focus on real-time emergency alerting, the platform addresses the critical gaps in current digital safety solutions.

While the system has not yet been launched, its design and predicted performance indicate strong potential for real-world impact. Its integration of fast alerts, secure data handling, and responsive UI supports the platform's goal to serve as a dependable safety companion.

Future Scope:

- **Initial User Testing:** Try the app within small groups like local students or office workers to understand how it works in real-life situations.
- **Connect with Local Help Services:** Work on linking the app with local police stations or emergency helplines so alerts can be received and acted upon quickly.
- **Microphone Activation:** Start audio recording automatically during an alert to capture what's happening in real time.
- **Camera Streaming:** Allow the phone's camera to send live video to trusted contacts or authorities when an SOS is triggered.
- **Alert History:** Keep a record of past alerts for the user to review or share.
- **Auto Check-Ins:** Let users set regular reminders to confirm they are safe.
- **Sync Contacts:** Make it easier to add trusted contacts from the phone's contact list.
- **Safety Awareness:** Organize sessions in schools, colleges, and community groups to teach people how to use the app and stay safe.

By continuing to test and improve with help from users and local support systems, Tech Guard SHE can become a practical, everyday tool that helps women feel safer and more supported.

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