International Scientific Journal of Engineering and Management (ISJEM) ISSN: 2583-6129
Volume: 04 Issue: 10 | Oct – 2025 DOI: 10.55041/ISJEM05081
An International Scholarly || Multidisciplinary || Open Access || Indexing in all major Database & Metadata

Women's Safety System: A Smart Approach for Realtime Protection and Emergency Response

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ABSTRACT

The safety of women continues to be one of the most urgent social issues in today's society. Even with swift progress in digital technology, women still face harassment, stalking, domestic violence, and physical attacks in both public and private settings [1]. These dangers jeopardize their physical health while limiting their freedom, movement, and involvement in the community. To tackle this problem, this paper presents a Women's Safety System that utilizes GPS tracking, immediate alert notifications, and real-time interaction with trusted contacts and emergency services [2]. The platform combines a web app developed using PHP and MySQL as the backend, providing dependable data handling and safe communication. The application seeks to reduce response time in urgent situations by allowing users to send emergency alerts along with their live location with a simple button press. Extra preventive measures, including contact logging, location sharing, and SOS activation, further improve its efficacy. The system is created to be easy to use, safe, and adaptable, guaranteeing access on various platforms and devices. This strategy merges digital advancement with social accountability, helping to build a safer environment for women and providing them with prompt assistance in emergencies.

Keywords— Female Safety, GPS Monitoring, Emergency Notifications, Web App, PHP, MySQL, Live Location, SOS System

I.INTRODUCTION

The topic of women's safety remains a major social issue worldwide, impacting women of various ages and backgrounds [1]. Accounts of harassment, stalking, domestic abuse, and physical attacks underscore the ongoing dangers women encounter in both public and private areas. Although conventional safety precautions like self- defense courses, pepper spray, and specific

helplines are available, they frequently prove inadequate in crucial situations because of slow response times, restricted access, or insufficient real-time communication [2]. These constraints highlight the critical requirement for technology-based solutions that can offer prompt assistance, improve response effectiveness, and guarantee increased safety for women in precarious circumstances.

Thanks to the swift advancement of digital technologies, mobile gadgets, and widespread

internet access, it is now feasible to create applications that provide real-time location monitoring, urgent notifications, and immediate links to reliable contacts and officials. The suggested Women's Safety System utilizes these developments to build a platform that is dependable, easy to use, and safe. The system employs GPS tracking to oversee the user's current location, allowing for rapid identification of her whereabouts in emergencies. Moreover, it incorporates alert services that can immediately inform pre-registered contacts and law enforcement with the user's real-time location, thus reducing the delay in delivering assistance [3].

In addition to emergency response, the system functions as a preventative measure by enhancing feelings of safety and enabling women to respond quickly in challenging circumstances. Through the integration of web applications and solid backend support using PHP and MySQL, the solution guarantees efficient data handling, scalability, and access on various devices. In the end, this strategy not only tackles urgent dangers but also aids in creating a more secure digital environment for - women, fostering their self-assurance and involvement in social, educational, and career pursuits

II. LITERATURE REVIEW

The progress of women's safety systems has been extensively researched in various fields such as mobile computing, IoT, artificial intelligence, and cloud services. Many mobile applications primarily depend on panic buttons or SMS alerts (e.g. Lakshané & Chinmayi, 2016; The use of mobile phone applications overview, 2022) cis-india.org+1. Although these approaches are beneficial, their efficiency is constrained by the need for manual activation and the absence of real-time oversight. Many research efforts have sought to combine GPS tracking with alert systems, facilitating quicker communication with trusted contacts and emergency services (e.g. Android App for Women Safety, 2023) ResearchGate. Nonetheless, several of these applications offer only last-known location information instead of ongoing real-time tracking, diminishing their dependability in urgent circumstances (e.g. Women Safety Enhancement Application, 2024) IJRASET. Moreover, challenges like lagging message transmission, energy consumption, and inadequate network access frequently influence effectiveness (see IoT role in women safety: A systematic literature review, 2022) Wjarr. Recent studies have investigated the use of wearable devices, IoT sensors, and machine learning models to predict hazardous environments or identify anomalous user behavior (e.g. Automatic Prediction and Identification of Smart Women, 2021; Assessment and Exploring of Women's Safety Using ML, 2025) journals.ut.ac.ir+1. These methods emphasize prevention by delivering proactive notifications before incidents occur. For instance, systems integrating geofencing with predictive analytics can alert users when they enter hazardous locations (Women Safety and Monitoring System Using Geo-Fence, 2024) ResearchGate, whereas others utilize voice recognition or gesture detection to activate SOS signals in hands-free situations (Women Safety App to Detect Danger Automatically, 2024) ResearchGate. Even with these advancements, a notable gap still exists in

merging preventive functions, immediate responses, and secure data management into one system. The Women's Safety System proposed in this study aims to address these gaps by integrating GPS tracking, SOS signals, preventive alerts, and secure communication to develop a comprehensive solution.

III. DATASET DESCRIPTIONS

The creation and assessment of the suggested Women's Safety System required various datasets for tracking locations, user data, and testing system performance.

User Profiles Dataset:

Includes registration information like user ID, name, contact details, and assigned emergency contacts. This data set guarantees that the SOS alert system accurately directs emergency notifications to pre-registered trusted contacts.

Dataset for Tracking Locations:

Comprises ongoing GPS data gathered throughout system tests.

Data points include latitude, longitude, time stamp, and rate of motion. Employed to evaluate the precision of real-time location sharing and journey tracking features.

Alert Logs Data Collection:

Stores all initiated SOS events with contextual information like alert type (manual tap, power button press), activation time, response duration, and notification status.Aids in assessing system dependability and quantifying end-to-end alert delivery times.

Dataset for Preventive Monitoring:

Logs user-defined geofencing limits, prohibited areas, and travel paths.Employed to determine if the system efficiently alerts users and their contacts when a route deviation or unsafe zone entry occurs.

Testing and Simulation Data Collection:

Simulated situations (e.g., late arrival, lack of network, multiple SOS activations) to evaluate the system's resilience.Guarantees scalability and verifies system performance in high-stress situations.All datasets were safely stored in the MySQL backend database, with encryption implemented for sensitive information such as GPS coordinates and emergency contact information. This not only safeguards user privacy but also preserves data integrity for precise evaluation of system performance

III.RELATED WORK

Most existing women safety apps depend on panic buttons or SOS messages that users have to activate manually[2],[3].But relying on the user to start the system can be risky in dangerous situations. Also, many apps only show the last known location instead of real-time movement. The lack of preventive features also leaves users vulnerable until something happens. A better system that includes both prevention and emergency features is needed to solve these problems [4].

III. PROPOSED SYSTEM

The suggested system functions as both a web and mobile application, providing accessibility and ease of use for users on various platforms [4]. A key feature is real-time GPS tracking, which

constantly observes the user's current location and instantly communicates it with trusted contacts during emergencies. This enables family or friends to track the user's movement and react promptly if any anomalies arise [5]. To enhance speed and dependability in panic scenarios, the system offers SOS activation via multiple power button presses or a single-tap emergency alert within the app, minimizing the time required to send notifications [6].

Besides managing emergencies, the system includes various preventive measures. Trip tracking functionalities allow users to share their intended routes and projected arrival times with trusted individuals, who receive immediate alerts if the trip exceeds the anticipated duration or strays from the initial course. In the same way, alerts for restricted zones inform the user when they enter hazardous areas, providing a proactive safety measure before any event takes place [7]. To improve personal safety, the app incorporates built-in security features like loud alarms to draw public attention, fake call activations to divert potential assailants, and automatic voice recording to obtain audio evidence beneficial for reporting incidents to officials [8]

Safety is also a significant factor in the design of this system. Every interaction among the mobile app, web application, and server is encrypted with secure protocols to safeguard sensitive information, such as live location data and emergency records, against unauthorized access or exploitation. This guarantees the privacy, authenticity, and dependability of the service [6], [5]. The proposed system creates a robust safety framework that improves women's security before, during, and after a threat by integrating preventive awareness, immediate emergency assistance, and post-incident evidence gathering [11]

IV. PROJECT DESIGN AND EXECUTION

The proposed Women's Safety System was developed using a combination of PHP and MySQL for the backend, and HTML, CSS, and JavaScript for the front-end interface [4]–[7]. The backend was designed to ensure safe data handling, quick processing, and scalability, while the front end focuses on user experience and accessibility. PHP is crucial for overseeing user authentication, managing session control, and processing SOS notifications. When logging in, PHP verifies the credentials with the MySQL database, making certain that only authorized users can access the system [4]. In critical scenarios, PHP scripts spring into action to process SOS requests, retrieve the user's location, and dispatch alerts to trusted contacts and emergency personnel in mere seconds [5].

The MySQL database is intended to store essential data, including user profiles, emergency contacts, current GPS coordinates, and historical alert records. Efficient indexing and relational structure enable rapid query processing, vital in crises where timing is critical. MySQL ensures data integrity and security, preventing replication or loss of data [5].

On the client side, the system utilizes HTML and CSS to develop a stylish, versatile, and user-friendly interface that adapts to both web and mobile environments. JavaScript, along with

AJAX, allows for real-time interaction without requiring full page reloads. When an SOS signal is triggered, AJAX allows for real-time updates of the current location on the server, which is promptly displayed to contacts. This form of asynchronous communication improves the system's responsiveness and ensures a seamless user experience [6].

Additionally, the system incorporates data encryption techniques to protect communication between the client and server, preventing unauthorized access or modification of sensitive information, such as GPS coordinates and emergency logs [7]. Integrating these technologies guarantees reliability, scalability, and security, rendering it suitable for practical application

V. RESULTS AND DISCUSSION

The Women's Safety System underwent testing in various conditions to assess its effectiveness, precision, and dependability. The findings indicated that emergency alerts were sent nearly immediately, with the user's live GPS location shared in real time with registered contacts [6]. The accuracy of the location was reliably within several meters, which is adequate for prompt help in emergencies. In high-pressure simulations, activating the SOS via power button presses was extremely efficient, enabling alerts to be dispatched without requiring phone unlocking or navigation.

Users additionally indicated an increased feeling of safety due to the system's preventive capabilities, like trip monitoring and zone restriction notifications, which offered comfort even prior to a possible threat arising [7]. Trip monitoring proved particularly beneficial during nighttime travel, with contacts being automatically notified of any unexpected delays or changes in the planned route.

In contrast to current systems that depend exclusively on SOS-based emergency notifications, the suggested model showed a distinct benefit. It not only guaranteed quicker response times but also offered multi-faceted protection via proactive monitoring, immediate salerts, simulated call triggers, and automated audio evidence gathering [8]. These extra tools lessened reliance on outside aid and provided

instant self-defense assistance until help arrived. The communication framework's security, established by encryption protocols, enhanced users' confidence in the system's dependability and privacy.

The testing stage emphasized the system's functionality, ease of use, and scalability, positioning it as a solid option for real-world implementation as both a web and mobile application

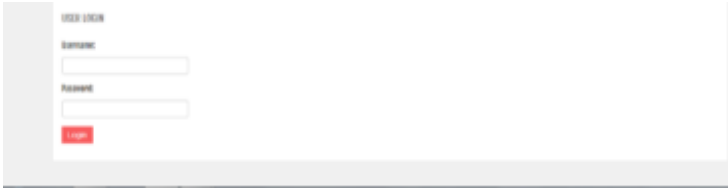

Fig 3.User login

Fig.4 Location

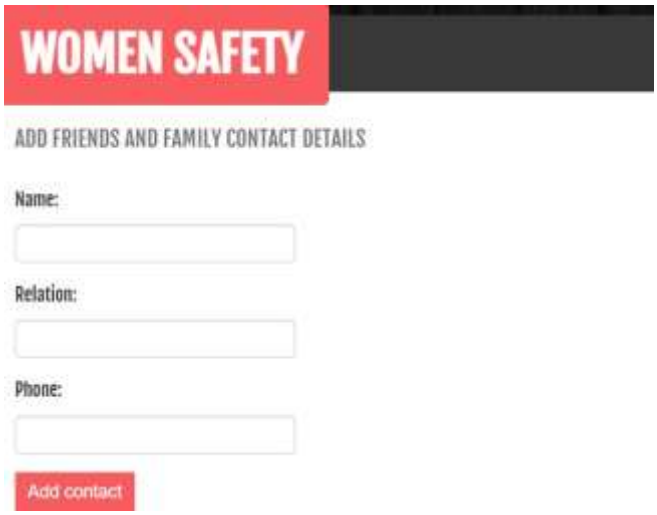

Fig.5 Adding details

Fig.6 Sending alert

VI. CONCLUSION

The proposed Women's Safety System provides a comprehensive, tech-driven strategy to address a critical societal concern of our time: the protection of women [1]. By integrating live GPS tracking, SOS alerts, preventive actions, and real- time monitoring, the platform offers fast, dependable, and easily reachable support during emergencies [4]. Unlike traditional systems that emphasize one specific feature, this approach creates an all-encompassing safety framework that operates before, during, and after a potential threat. The system enhances women's confidence in traveling and moving independently while also contributing to a safer community. It provides users with immediate self-defense resources, while ensuring that trustworthy contacts and authorities receive accurate details to act swiftly.

In the coming years, improvements might include integrating Artificial Intelligence (AI) for forecasting risk evaluation, alerting users to potential hazards based on location patterns, timing, and environmental data [2]. Moreover, collaborating with NGOs and organizations focused on women's rights could extend the system's reach to vulnerable communities, and a direct link to police hotlines and emergency services would enable faster responses on the ground [3]

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