

# सुरक्षा Setu – Empowering Women, Securing Everyone

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**Abstract** - Women's safety and quick access to emergency services have become increasingly important in today's modern urban environments. This paper presents "सुरक्षाSetu a web-based women safety and assistance platform designed to provide real-time protection, emergency support, and incident management for women. The proposed system integrates multiple safety features like live alerts, live travel tracking, guardian alerts, and crime prediction to enhance user awareness and security. The application also includes a dedicated "Suraksha Care module that provides information about nearby hospitals, police stations, and resources for physical and mental health support. In emergency situations, the SOS module allows women to send instant alerts with live location to guardians. It also provides additional support through safety tips, videos, chatbot assistance, NGO contacts, and feedback options. And an admin panel that efficiently manages users and monitors reported incidents. The "सुरक्षाSetu platform aims to create a complete safety ecosystem by combining emergency response mechanisms, healthcare support, and community-driven incident reporting to improve personal security and public safety.

**Key Words:** Women's safety, Emergency alerts, GPS tracking Incident report, Personal security, Crime prediction, Emergency responses

## 1. INTRODUCTION

Personal safety has emerged as a critical concern in modern society due to the increasing number of crimes, and emergency situations[1][2]. Individuals, specifically women often face critical situations demanding urgent assistance. To overcome these limitations, this research proposes सुरक्षाSetu, an integrated safety application designed to enhance personal security through multiple integrated modules. The proposed system includes features such as SOS alerts, live tracking, guardian notifications, incident reporting, Health Support System, and Safety Guidance. The platform is built using contemporary technologies including Python, Streamlit, SQLite, and machine learning techniques. Additionally, the platform provides educational resources such as safety tips, videos, chatbot assistance, and NGO support information to strengthen awareness and emergency preparedness among users. By combining safety, health, and awareness services within a single platform, सुरक्षाSetu aims to empower women with efficient digital support that enhances personal security, facilitates faster emergency response, and supports a secure environment using technology-driven approaches.[2][5]

## 2. OBJECTIVE

The Core Objective of the सुरक्षाSetu system is to develop a digitally driven platform that enhances women's safety, emergency responses, and awareness

- To develop an integrated digital platform that provides multiple safety, emergency, and awareness includes support services for women
- To design a unified safety platform incorporating real-time safety alert systems, SOS alerts along with call & location, and guardian notification systems.
- To integrate advanced prediction and reporting systems that assist in recognising unsafe locations.
- To strengthen user health support through easily accessible medical services and access to emergency service information.
- To enhance user knowledge and preparedness through safety tips, educational content, chatbot assistance, and guidance resources.

## 3. LITERATURE REVIEW

Recent technological solutions have been developed to address the growing concerns related to women's safety. Applications such as Safetipin, bSafe, and Himmat provide basic security features, including SOS alerts and GPS-based location sharing, which enable users to notify trusted contacts or authorities during emergency situations [6][8].

Although these platforms offer immediate assistance, many of them are limited in functionality. Essential features such as crime prediction, incident reporting, healthcare support, travel safety monitoring, and safety awareness resources are often distributed across different applications [1][3]. As a result, users are required to rely on multiple platforms to access a complete range of safety services.

To overcome these limitations, the proposed सुरक्षाSetu platform introduces an integrated safety system that combines multiple critical services within a single application. The platform incorporates emergency SOS alerts, predictive crime analytics, real-time risk notifications, travel safety support, incident reporting, healthcare assistance, and educational awareness resources. By consolidating these features into a unified framework, the system aims to improve emergency response efficiency while promoting

proactive safety awareness through AI-driven technologies [2][4].

## 4. SYSTEM ARCHITECTURE

The proposed सुरक्षाSetu platform is designed using a modular architecture that integrates multiple technologies to provide an efficient and reliable safety system for women. The architecture consists of four major components: the User Interface (Front-End), Backend Processing Layer, Database and Data Management Layer, and External Technology Integration Layer. Each component works together to ensure seamless operation, real-time response, and secure data handling.

### 4.1 User Interface (Front-End)

The front-end of the system is developed using the Python-based Streamlit framework, which enables the creation of an interactive and user-friendly interface. The interface allows users to easily access the core functionalities of the platform. These functionalities include sending SOS alerts during emergencies, receiving safety notifications, monitoring travel routes, reporting incidents, and accessing awareness resources related to personal safety. The intuitive design ensures that users can quickly navigate the system and access critical safety features when required.

### 4.2 Backend Processing Layer

The backend layer is responsible for handling the core logic and processing operations of the application. It is implemented using Python and utilizes several libraries to perform data processing and predictive analysis. Libraries such as Pandas and NumPy are used for data manipulation and numerical computations, while Scikit-learn supports machine learning models for predictive crime analysis. Communication services for sending emergency notifications and alerts are facilitated through the Twilio API. Additionally, location-based functionalities are implemented using tools such as Geopy, Geocoder, and Streamlit Geolocation, which help in identifying and tracking user locations in real time.

### 4.3 Database and Data Management Layer

The system uses a centralized data storage mechanism to manage application data efficiently. User information, incident reports, safety alerts, and prediction-related data are stored using SQLite databases and CSV files. This structure ensures reliable data storage, easy retrieval, and efficient management of system records. The database layer supports the smooth functioning of the application by maintaining structured data that can be used for analysis, reporting, and system operations.

### 4.4 External Technology Integration

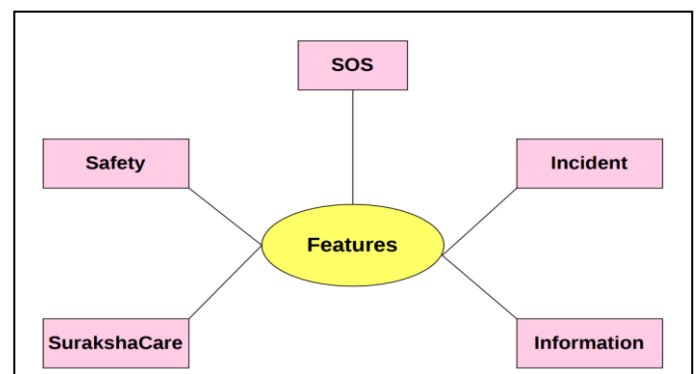
To enhance system functionality, the platform integrates several external technologies and services. Location-based APIs are used to provide geographic information and route monitoring features. In addition, **Google Generative AI** is integrated to provide chatbot-based assistance, enabling users to obtain guidance, safety tips, or help during uncertain situations. The modular integration of these external services improves the scalability and reliability of the platform while enabling real-time safety support.

### 4.5 Architecture Overview

The overall architecture of the सुरक्षाSetu system ensures efficient communication between the front-end interface, backend processing components, and the database layer. The modular design allows the system to scale easily and incorporate additional features in the future. By combining data processing, machine learning capabilities, location services, and real-time communication tools, the platform provides a comprehensive safety framework that supports emergency response, predictive analysis, and user awareness.

## 5. FEATURES OF सुरक्षाSetu

The सुरक्षाSetu platform offers a set of integrated functionalities aimed at improving personal safety and providing support during emergency situations. The system is designed to enable users to quickly access assistance, report incidents, and obtain essential safety information. It combines key modules such as Safety Alerts, Suraksha Care services, Incident Reporting, and Information Resources within a unified platform to create an effective safety support system. By integrating these capabilities, the application helps users respond to potential risks more efficiently, obtain timely assistance, and remain informed about important safety practices and available support services.



**Fig -1:** Features of सुरक्षाSetu

## 5.1 Safety

The Safety module is a central component of the सुरक्षाSetu system, designed to help women remain protected during daily activities and travel. It provides real-time alerts, emergency support, and continuous safety monitoring to enable prompt assistance in critical situations [1][3]. The module comprises several sub-features:

- **Live Alerts:** Delivers up-to-date safety information, including nearby SOS signals, crime reports, safe locations such as hospitals or police stations, and crime heatmaps highlighting high-risk areas. This helps users stay informed and make safer travel decisions [2].
- **Live Travel:** Allows users to plan a secure route from origin to destination while receiving notifications about potential risks, including general crime incidents, disasters, and traffic conditions [3].
- **Guardian Alert:** Enables users to register trusted contacts who receive automatic notifications if the user fails to confirm arrival at their destination within the expected time frame [1].
- **Crime Prediction:** Utilizes historical crime data to provide insights into past incidents and forecasts potential high-risk areas, assisting users in planning safer travel routes [2][3].

## 5.2 Suraksha Care

The Suraksha Care module focuses on supporting both the physical and mental well-being of women while ensuring quick access to essential emergency services [1][5]. It includes the following sub-features:

- **Nearby Hospitals:** Enables users to quickly locate hospitals using either their live GPS location or manual city input, ensuring timely medical assistance in emergencies [2].
- **Physical Health:** Provides tools for maintaining overall health, including activity tracking, exercise guidance, diet and hydration reminders, menstrual cycle monitoring, and emergency health check prompts. These features promote physical resilience, empowering women to better handle unexpected situations [3].
- **Mental Health:** Supports emotional and psychological well-being through mental health quizzes, mindfulness exercises, mood journaling, and access to a support network. Encouraging proactive mental care helps women respond effectively to stress and challenging circumstances [4][6].
- **Police Station Locator:** Allows users to quickly identify nearby police stations based on real-time location data, facilitating prompt reporting and access to law enforcement support during emergencies [1].

## 5.3 The SOS

The SOS module is a critical component of the सुरक्षाSetu system, designed to provide immediate assistance during

dangerous situations [1][3]. When a user encounters a threat, activating the SOS button triggers an automatic emergency protocol. The system sends an SMS containing the user's real-time location and simultaneously places calls to up to five pre-registered trusted contacts. In addition, the system notifies local law enforcement authorities to ensure prompt intervention [2][4]. By enabling instant communication with both personal contacts and emergency services, the SOS feature minimizes response time, enhancing the likelihood of rapid support and significantly improving personal safety for women [3][5].

## 5.4 Incident Reporting

The Incident Reporting module enables users to document and share experiences of unsafe or threatening situations, fostering awareness within the community [1][6]. Users can view reports submitted by others, providing insights into potentially hazardous locations or scenarios and allowing them to take precautionary measures. By facilitating the sharing of real-life experiences, this feature establishes a community-driven safety network, empowering women to support one another and collectively enhance personal and public safety [2][5]. This participatory approach not only increases situational awareness but also strengthens confidence and preparedness in dealing with potential risks [3][6].

## 5.5 Information

The Information module provides users with resources and tools to stay informed, prepared, and proactive about personal safety [1][5]. It educates women about safety practices, connects them with support organizations, and enables feedback to continuously improve the platform [2][6]. The module includes several key components:

- **Safety Tips:** Offers practical guidelines and strategies that users can follow in daily life and during travel to enhance awareness, avoid risky situations, and maintain personal security [3].
- **Personal Safety Videos:** Contains instructional videos on self-defense and safety techniques, helping women learn effective strategies to respond confidently in dangerous situations [1][4].
- **Chatbot Assistance:** Provides instant support through a customized AI-powered chatbot that answers questions related to safety, health, or general guidance, ensuring users receive timely and accurate information [2][5].
- **NGO Support:** Supplies information about nearby NGOs and organizations that offer legal, emotional, or social support in cases of harassment, violence, or emergencies, facilitating access to critical resources [3][6].
- **Feedback:** Allows users to share experiences and suggestions to improve the system's effectiveness,

ensuring that the platform evolves to better meet women's safety needs [1][5].

## 6. TECHNOLOGIES USED

### 6.1 Programming and Framework

Python: Serves as the primary programming language, integrating all system functionalities.

Streamlit: Used to design and deploy an interactive web-based interface for intuitive user interaction.

### 6.2 Database and Security

SQLite3: Provides a lightweight database to store user profiles, incident reports, and application data.

Hashlib: Implements secure password hashing for protecting user authentication information.

### 6.3 System Utilities

Base64: Handles encoding and decoding of images and binary data within the platform.

OS Module: Facilitates file management, directory operations, and system-level tasks.

### 6.4 Data Processing and Analysis

NumPy: Used for numerical computations and efficient manipulation of data arrays.

Pandas: Supports analysis and preprocessing of crime datasets, enabling effective data handling and reporting.

### 6.5 Location and Mapping Services

Geopy: Obtains geographic coordinates and performs location-based calculations.

Geocoder: Converts addresses and city names into geographic coordinates for mapping purposes.

Folium: Creates interactive maps to visualize safety alerts, travel routes, and high-risk zones.

Streamlit Geolocation: Fetches and displays users' real-time location within the application.

### 6.6 API and Navigation Services

Requests: Facilitates communication with external APIs to retrieve and send data.

OpenRouteService: Provides routing and navigation capabilities between source and destination points.

### 6.7 Communication and Alerts

Twilio: Enables automated emergency SMS alerts and phone calls to registered contacts during SOS situations [3].

### 6.8 Artificial Intelligence

Google Generative AI (GenAI): Implements an intelligent chatbot for safety guidance, user support, and interactive assistance [2][6].

### 6.9 Additional Utilities

Random: Generates dynamic safety tips and simulated alert data for testing and user engagement.

ReportLab: Creates PDF reports and documentation for incident reporting and administrative purposes.

## 7. Working of the System

The सुरक्षाSetu system is designed as an integrated web-based platform that delivers safety, health, and awareness services for women [1][2]. The workflow begins with user registration and login, where individuals create accounts and securely store personal details along with up to five trusted guardian contact numbers in the database [3].

After authentication, users can access various modules:

- Live Alerts: Provides real-time updates on SOS notifications, crime reports, nearby safe locations, and safety heatmaps, helping users make informed travel decisions [1][4].
- Live Travel: Allows users to enter source and destination locations and receive real-time safety alerts, traffic updates, and route guidance to avoid high-risk areas [2][5].
- SOS & Guardian Alerts: In critical situations, users can activate the SOS button, which sends SMS alerts with live location data to registered contacts and local authorities. The Guardian Alert feature further ensures timely notifications to trusted contacts if users do not confirm arrival at their destination [3][5].
- Incident Reporting: Enables women to report unsafe situations or crimes, creating a community-driven network of shared experiences. Other users can view these reports to remain aware of potential risks in their vicinity [1][6].
- Crime Prediction: Analyzes historical crime data to generate insights and forecasts for selected cities or states, supporting users in planning safer travel routes [2][3].
- SurakshaCare: Focuses on women's health and well-being by providing information on nearby hospitals and police stations, as well as tools for physical health tracking and mental health support [5][6].
- Information Module: Offers safety tips, personal safety videos, NGO support contacts, and an AI-powered chatbot for immediate guidance and assistance [2][6].

Overall, the system integrates location services, emergency communication, predictive analytics, and educational resources to provide a comprehensive safety solution for women. This approach ensures timely assistance, promotes situational awareness, and empowers users with tools for proactive safety management [1][3][5].

### 8. ADVANTAGES OF सुरक्षाSetu

Advantages of सुरक्षाSetu

Improves women's safety

Fast emergency support

Real-time safety information

Safe travel support

Awareness about crime

Health and Community support

User friendly

Fig 2: Advantages of सुरक्षाSetu

### 9. Future Scope

- Multi-Platform and Travel Support:**  
 The system can be extended to support multiple platforms, including mobile applications and wearable devices, ensuring accessibility across different user environments. Additionally, integrating transport details such as cab information can enable real-time vehicle tracking during emergencies, enhancing travel safety [2][3].

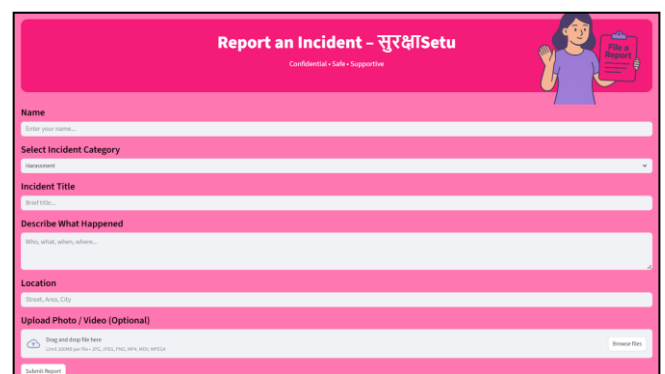
- Smart Emergency Automation:**

Future enhancements may include automated alert systems that directly notify emergency services and authorized contacts using advanced technologies such as IoT devices and drones. This can significantly reduce response time and improve the efficiency of emergency interventions [1][5].

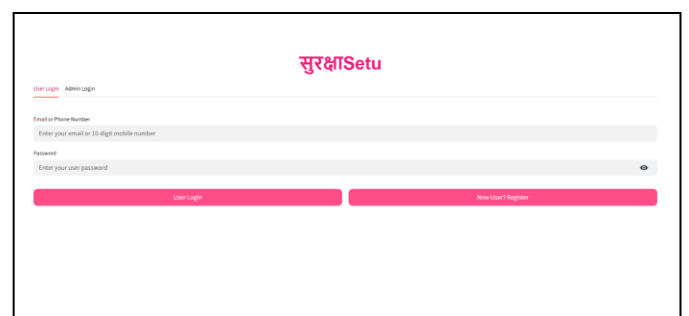
- Data Analytics for Safety Insights:**

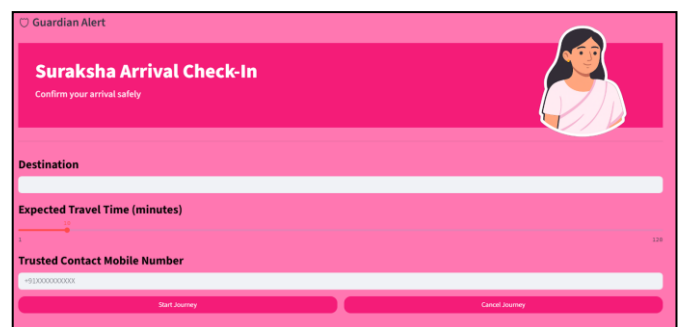
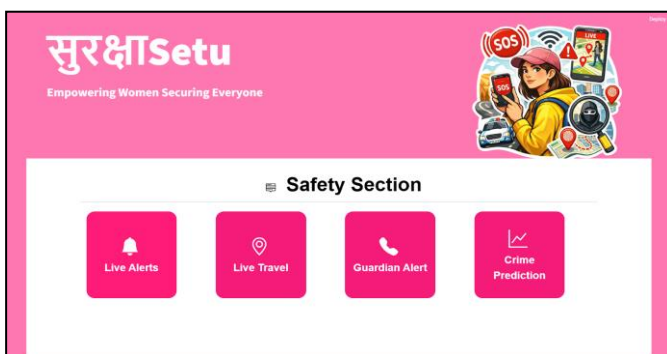
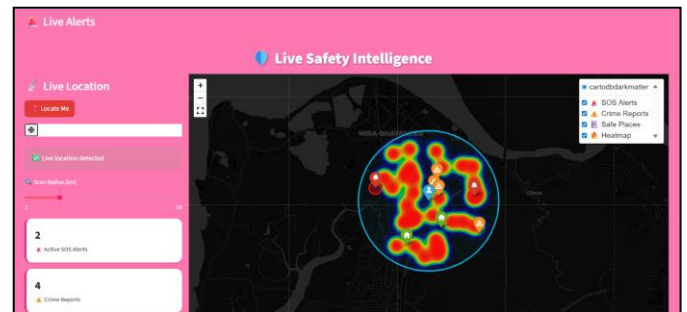
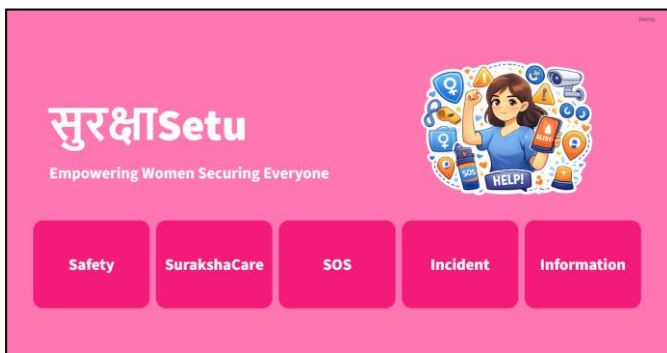
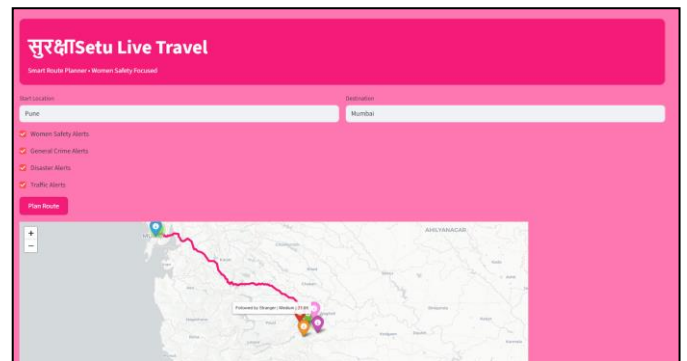
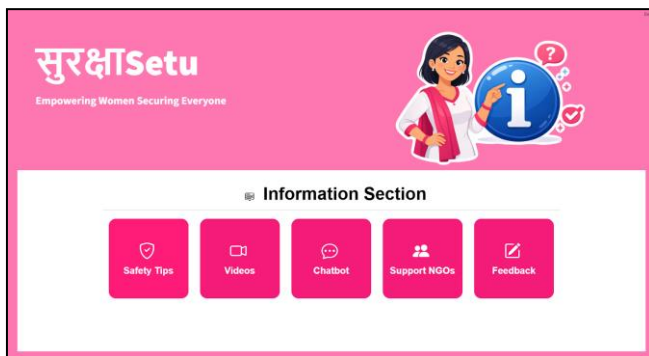
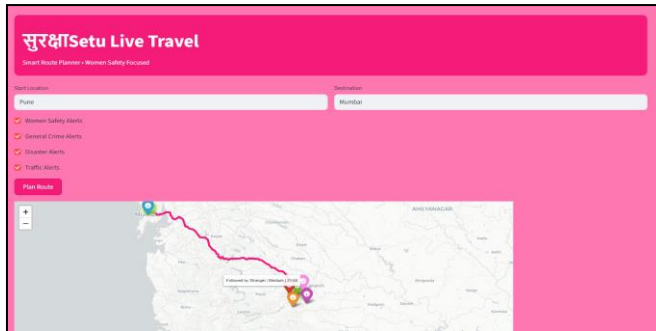
By analyzing anonymized user data and safety alerts, the system can identify high-risk zones and patterns of criminal activity. These insights can contribute to improved community safety frameworks and assist authorities in preventive planning [2][6].

- Offline and Low-Connectivity Functionality:**  
 Incorporating offline capabilities or local data caching can ensure that essential features such as SOS alerts and safety notifications remain functional in areas with limited or no internet connectivity, thereby increasing system reliability [3].



### 10. Images of सुरक्षाSetu



## 11. Conclusion

The सुरक्षाSetu system is developed to enhance women's safety by integrating multiple safety, health, and awareness features into a unified digital platform. It incorporates functionalities such as real-time alerts, safe travel monitoring, SOS emergency response, crime prediction, incident reporting, and SurakshaCare health services, enabling users to remain informed, prepared, and protected in various situations.

By leveraging modern technologies including location-based services, real-time communication systems, and AI-driven chatbot assistance, the platform ensures prompt support and improved personal security. Furthermore, the integration of community-driven features and awareness resources strengthens support networks and promotes proactive safety practices.

Overall, सुरक्षाSetu contributes toward building a safer environment by empowering women with accessible, technology-driven tools that enhance safety, awareness, and confidence.

## REFERENCES

[1] J. Bengare, R. Jadhav, G. Kapale, and R. Chandan, "Android-Based Women Safety Application with Real-Time Alerts and Location Tracking," *International Journal of Science, Innovation and Engineering (IJSCI)*, vol. 2, no. 10, pp. 1400–1406, 2025.

[2] M. Ara and N. Rajeshwari, "AI-Based Women Safety and Alert System," *International Journal of Advanced Research in Computer and Communication Engineering (IJARCCE)*, vol. 15, no. 1, 2026, doi: 10.17148/IJARCCE.2026.15155.

[3] S. S. Pawar, R. Roy, K. V. Sawant, R. B. Singh, and M. Navale, "RescueNow: Real-Time SOS and Predictive Women's Safety System," *International Journal for Research in Applied Science & Engineering Technology (IJRASET)*, 2025, doi: 10.22214/ijraset.2025.70070.

[4] S. Gupta, S. Ranjan, and A. Ahmad, "Review Paper on Women Safety System," *International Journal for Research in Applied Science & Engineering Technology (IJRASET)*, 2024, doi:10.22214/ijraset.2024.57923.

[5] P. Sarma, D. Ahmed, and P. Bezbaruah, "Android-Based Woman Safety App," *Indian Journal of Science and Technology*, vol. 16, no. SP2, pp. 60–69, 2023, doi: 10.17485/IJST/v16iSP2.8767.

[6] M. Yadav and S. M. M. S. Karna, "An Analysis of Women Safety Apps in India: Crime Against Women," *International Journal of Indian Psychology*, vol. 13, no. 3, pp. 2873–2890, 2025, doi:10.25215/1303.262.

[7] P. K. Aghao, S. M. Balkawade, K. S. Bende, T. Thakare, and P. Nair, "Suraksha Sathi: An Innovative SOS Application for Personal Safety," *Recent Trends in Electronics Communication Systems*, vol. 11, no. 03, pp. 21–30, 2024.

[8] Times of India, "Popular Women's Safety Apps in India," 2023. [Online]. Available: <https://timesofindia.indiatimes.com/gadgets-news/popular-womens-safety-apps-in-india/photostory/99388808.cms>