

# Trayati: A Real-Time Emergency Alert System with GPS Tracking and WhatsApp Automation

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**Abstract** - This paper presents Trayati, a real-time emergency alert system designed to provide immediate assistance during critical situations. Traditional emergency systems often depend on manual actions, which may not be feasible during emergencies. The proposed system automates the process of sending alerts and sharing real-time location with pre-registered contacts.

The system is developed using Python and the Django framework, integrating technologies such as GPS tracking and WhatsApp automation through PyWhatKit. When the SOS feature is activated, the system automatically sends emergency messages along with the user's live location. Continuous location tracking ensures accurate monitoring until safety is restored.

The proposed solution improves response time, minimizes user effort, and enhances communication reliability by using widely adopted platforms. The system is user-friendly, efficient, and scalable, making it suitable for real-world safety applications.

**Key Words:** Emergency Alert System, GPS Tracking, SOS, Django, WhatsApp Automation, Real-Time Location, Public Safety

## 1. INTRODUCTION

In today's rapidly evolving world, ensuring personal safety has become increasingly important due to rising incidents of accidents, crimes, and unexpected emergencies. Individuals may find themselves in critical situations where immediate help is required, but they may not be able to communicate effectively due to panic, injury, or environmental constraints.

Traditional emergency systems rely heavily on manual interaction such as dialing phone numbers, typing messages, or navigating through mobile applications. During emergencies, such actions may not be feasible, resulting in delayed communication and reduced chances of timely assistance.

An emergency alert system is a technological solution

that enables users to quickly notify their trusted contacts during distress situations. However, many existing systems provide only basic functionalities and lack automation, real-time tracking, and seamless communication.

The main objective of this project is to design and develop a real-time emergency alert system that minimizes user effort and maximizes response efficiency. The proposed system, Trayati, allows users to trigger an SOS alert instantly, which automatically sends messages along with live GPS location to emergency contacts.

The system utilizes Python and Django for backend development and integrates GPS services and WhatsApp automation for communication. Continuous location tracking ensures that contacts receive updated information, improving rescue effectiveness.

This project aims to provide a reliable, user-friendly, and efficient solution for enhancing personal safety and emergency response systems.

## 2. RELATED WORK

Emergency alert systems and personal safety applications have been widely developed to improve communication during critical situations. Early systems mainly relied on SMS-based alerts, where users manually sent messages to emergency contacts. Although simple, these systems lacked real-time tracking and were not reliable in dynamic situations.

Modern applications such as "112 India," "bSafe," and "My Safetipin" introduced features like GPS tracking, emergency calling, and alert notifications. While these applications improved safety, they still depend on manual user interaction, which may not be possible during panic or injury.

Recent studies highlight the importance of real-time location tracking, as it allows continuous monitoring of

the user's movement. However, many existing systems provide only static location sharing, which becomes ineffective if the user changes location.

Researchers have also explored the use of popular communication platforms for faster alert delivery. Platforms like WhatsApp are widely used and provide instant message delivery, increasing the chances of quick response compared to traditional SMS or app notifications.

Despite these advancements, most systems lack complete automation, continuous tracking, and seamless integration with user-friendly interfaces. The proposed system, Trayati, addresses these limitations by combining real-time GPS tracking with automated WhatsApp alerts, ensuring efficient and reliable emergency communication.

### 3. PROBLEM STATEMENT

In today's fast-paced world, emergency situations such as accidents, medical issues, and safety threats require immediate communication and quick response. However, many existing emergency alert systems are not fully effective in real-world scenarios due to several limitations.

One of the major challenges is the dependence on manual user interaction. Most systems require users to unlock their devices, open applications, and send messages or make calls. During critical situations, users may be under stress, panic, or physical difficulty, making it hard to perform these actions. This delay can reduce the chances of receiving timely help.

Another important limitation is related to location tracking. Many applications provide only a single or static location update when the alert is triggered. In real-life situations, the user's position may change continuously, and static location sharing becomes insufficient for accurate tracking. This makes it difficult for emergency contacts to locate the user quickly.

In addition, several systems do not integrate with commonly used communication platforms. Alerts may be sent through less frequently used applications or notifications, which can be easily missed or delayed. This reduces the effectiveness of emergency communication.

Furthermore, some existing systems lack proper automation and user-friendly design, making them less accessible to all types of users. These limitations highlight the need for a more efficient and reliable solution.

Therefore, there is a need to develop an automated

emergency alert system that minimizes user effort, provides continuous real-time location tracking, and ensures fast and reliable communication through widely used platforms. The proposed system aims to address these issues and improve overall emergency response efficiency.

### 4. PROPOSED SYSTEM

The proposed system, Trayati, is a real-time emergency alert and communication platform designed to provide immediate assistance during critical situations. The system focuses on reducing user effort, improving response time, and ensuring reliable communication through automation and continuous location tracking.

The core functionality of the system is based on a one-click SOS activation feature. When the user triggers the SOS alert, the system automatically initiates a sequence of operations without requiring further manual input. This includes fetching the user's current GPS location, generating an emergency message, and sending it to pre-registered emergency contacts.

One of the key features of the proposed system is real-time GPS tracking. Unlike traditional systems that share only a static location, Trayati continuously updates the user's location at regular intervals. This allows emergency contacts to monitor the user's movement in real time and take appropriate action quickly. Continuous tracking significantly improves the accuracy and effectiveness of emergency response.

The system integrates WhatsApp automation using the PyWhatKit library. Once the SOS alert is activated, the system automatically opens WhatsApp Web and sends emergency messages along with the user's live location to all registered contacts. Using WhatsApp as a communication platform increases the chances of immediate attention, as it is widely used and frequently accessed by users.

The application is developed using Python and the Django framework, which provides a robust backend for handling user authentication, data processing, and system logic. The system also uses additional libraries such as PyAutoGUI for automation, Requests for handling API calls, and Cryptography for securing user data. These technologies ensure smooth operation, security, and scalability of the system.

The proposed system also includes a user-friendly interface that allows users to register, log in, and manage their emergency contacts easily. The dashboard provides quick access to the SOS button, ensuring that users can trigger alerts without delay. The design

focuses on simplicity and accessibility, making it suitable for users of all age groups.

In addition to alert generation, the system maintains a record of location data and emergency events, which can be useful for analysis and future reference. The system is designed to handle network interruptions gracefully and ensure that messages are delivered reliably.

Overall, the proposed system combines automation, real-time tracking, and reliable communication to provide an efficient emergency alert solution. It addresses the limitations of existing systems by minimizing manual effort, improving accuracy, and ensuring faster response during emergencies.

## 5. METHODOLOGY

The methodology of the Trayati system describes the structured approach followed to detect emergencies, process user data, and send alerts efficiently. The system is divided into simple modules, each responsible for a specific task. This modular approach ensures that the system is easy to understand, reliable, and capable of providing fast response during emergency situations.

### 5.1 USER REGISTRATION AND LOGIN

This module is responsible for managing user access and ensuring that only authorized users can use the system. It provides a secure environment where users can register and log in to access emergency features.

- Users create an account by entering details such as name, email, phone number, and emergency contacts
- The system verifies login credentials using authentication mechanisms
- User information is stored securely in the database for future use
- Proper validation ensures that the entered details are correct and reliable

This module forms the foundation of the system by maintaining user identity and ensuring data security.

### 5.2 SOS ALERT ACTIVATION

The SOS alert feature is the core component of the system, designed to provide immediate response during emergencies. It is developed to minimize user effort and reduce delay in communication.

- A dedicated SOS button is provided on the dashboard for quick access
- The user can trigger the alert with a single click
- Once activated, the system automatically initiates the emergency process

- No additional steps such as typing messages or making calls are required

This module ensures that even in panic or stressful situations, users can easily send alerts without complexity.

### 5.3 GPS LOCATION TRACKING

This module plays a crucial role in identifying the exact location of the user during an emergency. Accurate and continuous location tracking helps emergency contacts respond effectively.

- The system retrieves the current GPS location using location services
- Latitude and longitude coordinates are captured to determine exact position
- The location is continuously updated at regular intervals
- Real-time tracking allows contacts to monitor user movement

This feature improves the accuracy of emergency response, especially when the user is moving or traveling.

### 5.4 WHATSAPP AUTOMATION

This module handles the communication process by sending emergency alerts through WhatsApp. It uses automation to ensure fast and reliable message delivery.

- PyWhatKit library is used to open WhatsApp Web automatically
- The system generates an emergency message containing user details and location link
- Messages are sent instantly to all registered emergency contacts
- Automation eliminates manual effort and ensures quick communication

Using WhatsApp increases the chances of immediate attention, as it is widely used and frequently accessed.

### 5.5 DATA MANAGEMENT AND USER INTERFACE

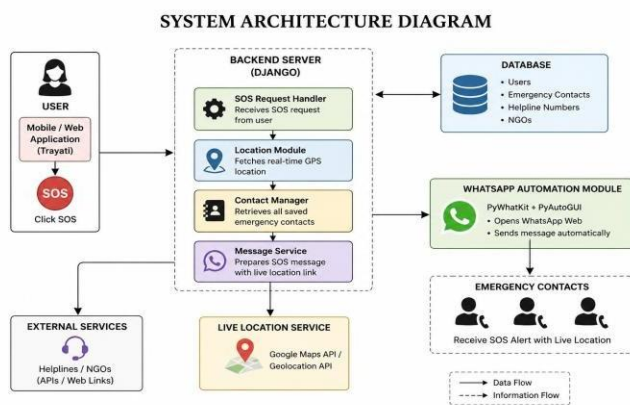
This module manages all system data and provides a user-friendly interface for interaction. It ensures smooth functioning and easy accessibility of features.

- User data, emergency contacts, and location details are stored in the database
- The system maintains records of alerts and location history
- A simple and clean interface is designed for easy navigation
- The dashboard provides quick access to important

features like SOS activation. This module ensures that the system remains efficient, organized, and easy to use for all users.

Overall, the methodology combines automation, real-time tracking, and secure communication to create an effective emergency alert system. Each module works together to provide a fast, reliable, and user-friendly solution for handling emergency situations.

## 6. SYSTEM ARCHITECTURE



**Fig-1: Trayati System Architecture Diagram**

The system architecture of the Trayati emergency alert system illustrates the flow of data and interaction between different components involved in handling an emergency. The system begins with the user accessing the application through a mobile or web interface. When the user presses the SOS button, a request is sent to the backend server built using the Django framework.

The backend server acts as the central processing unit of the system. It first handles the SOS request through the SOS Request Handler, which initiates the emergency process. The Location Module then retrieves the user's real-time GPS coordinates using geolocation services. This ensures that the exact position of the user is identified accurately.

Once the location is obtained, the Contact Manager module fetches all the pre-registered emergency contacts from the database. The Message Service then prepares an emergency message that includes the user's details along with a live location link generated using services like Google Maps API.

The system then interacts with the WhatsApp Automation Module, which uses libraries such as PyWhatKit and PyAutoGUI to automatically open WhatsApp Web and send emergency messages to all

emergency contacts. This automation ensures fast and reliable communication without requiring manual input from the user.

The database plays an important role by storing user details, emergency contacts, helpline numbers, and NGO

information. It ensures that all required data is readily available during emergency situations. Additionally, the system can integrate with external services such as helplines and NGOs through APIs or web links to provide extended support.

Finally, the emergency contacts receive the SOS alert along with the live location of the user, allowing them to respond quickly. The overall architecture ensures smooth data flow, real-time communication, and efficient coordination between all modules, making the system reliable and effective for emergency response.

The architecture is designed to be scalable and efficient, allowing future enhancements such as mobile app integration, voice-based SOS activation, and direct communication with emergency services. The modular structure ensures that each component can be upgraded independently without affecting the overall system performance. This makes the system adaptable to different environments and capable of handling real-world emergency scenarios effectively.

## 7. RESULTS AND DISCUSSION

The Trayati emergency alert system was successfully implemented and tested under different scenarios to evaluate its performance and reliability. The system was able to trigger SOS alerts instantly and perform all required operations such as location tracking and message delivery without significant delay.

During execution, the system accurately fetched the user's real-time GPS location and generated a live location link. This location information was successfully shared with all registered emergency contacts through WhatsApp automation. The use of a widely adopted communication platform ensured that alerts were delivered quickly and were easily noticeable by recipients.

The continuous location tracking proved to be highly effective, as it allowed emergency contacts to monitor the user's movement in real time. This is particularly useful in situations where the user is traveling or changing location, as it provides updated and accurate information for quick response.

The WhatsApp automation module performed efficiently by opening WhatsApp Web and sending messages automatically without requiring user intervention. This reduced the time taken for communication and eliminated the need for manual actions during emergencies.

The user interface of the system was designed to be simple and intuitive, allowing users to access features easily. The

SOS button was clearly visible and responsive, ensuring quick activation even under stressful conditions.

Performance analysis showed that the system operates with minimal response time and maintains consistency in different network conditions. The integration of multiple modules such as GPS tracking, automation, and database management worked smoothly without conflicts.

Overall, the results demonstrate that the Trayati system effectively improves emergency communication by providing fast alerts, accurate location tracking, and reliable message delivery. The system meets its objective of offering a user-friendly and efficient solution for real-time emergency response.

## 8. CONCLUSION

The Trayati emergency alert system was successfully developed to provide a reliable and efficient solution for real-time emergency communication. The system enables users to send instant SOS alerts along with their live GPS location, ensuring quick response during critical situations.

The integration of real-time location tracking and WhatsApp automation reduces manual effort and improves communication speed. The continuous location update feature enhances accuracy by allowing emergency contacts to track the user's movement effectively.

The system demonstrated stable performance with minimal delay and reliable message delivery. Its simple and user-friendly interface ensures easy access to emergency features, even during stressful conditions.

Overall, the proposed system provides a fast, automated, and practical solution for improving personal safety and emergency response.

## 9. FUTURE WORK

The Trayati emergency alert system can be further improved by adding advanced features to enhance usability and performance. A dedicated mobile application can be developed to provide better accessibility and faster response.

Future enhancements may include voice-based SOS activation, allowing users to trigger alerts without manual interaction. Integration with emergency services such as police, hospitals, and ambulance networks can also improve response time.

Additionally, the system can be extended with cloud storage, improved security features, and support for multiple communication channels such as SMS and email along with WhatsApp. These improvements will make the system more efficient, scalable, and suitable for real-world applications.

## 10. REFERENCES

- [1] Django Software Foundation, "Django Documentation," [Online]. Available: <https://docs.djangoproject.com/>
- [2] PyWhatKit Library, "PyWhatKit Documentation," [Online]. Available: <https://pypi.org/project/pywhatkit/>
- [3] Google Developers, "Google Maps Geolocation API," [Online]. Available: <https://developers.google.com/maps>
- [4] Python Software Foundation, "Python Documentation," [Online]. Available: <https://docs.python.org/>
- [5] WhatsApp Inc., "WhatsApp Web," [Online]. Available: <https://web.whatsapp.com/>
- [6] M. A. Rahman et al., "Smart Emergency Alert System Using GPS Tracking," *International Journal of Advanced Computer Science*, 2021.
- [7] S. Sharma and R. Gupta, "Real-Time Location Tracking and Emergency Response System," *IEEE Conference on Smart Systems*, 2020.
- [8] N. Kumar and P. Singh, "Automated Emergency Communication System Using Mobile Applications," *Journal of Computer Networks*, 2022.
- [9] A. Verma et al., "Women Safety Application Using GPS

and Alert Mechanism,” International Research Journal of Engineering and Technology, 2021.

[10] J. Smith, “Design of Real-Time Alert Systems Using Web Technologies,” Springer Publications, 2020.

[11] K. Patel and R. Mehta, “IoT-Based Emergency Alert and Tracking System,” IEEE International Conference on IoT Systems, 2022.

[12] P. Singh et al., “Location-Based Services for Emergency Management Systems,” Journal of Information Technology, 2021.

[13] R. Gupta and S. Jain, “Secure Data Communication in Web Applications,” International Journal of Computer Science, 2020.