

Original Article**MEDALERT - Realtime Medicine Availability and Emergency Finder****T. Santhosh¹, Dr. R. Sri Devi²**^{1,2}Department of Computer Applications (PG)

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**Abstract**

In emergency medical situations, quickly finding required medicines and nearby healthcare services is often difficult and time-consuming. The lack of a centralized system providing information about medicine availability, pharmacies, hospitals, and ambulance services can lead to delays in treatment. This paper presents MedAlert – a Real-Time Medicine Availability and Emergency Finder, a web-based application designed to help users quickly locate medicines and identify nearby healthcare facilities based on their location. The system allows users to search for specific medicines and view availability details from nearby pharmacies while also providing information about hospitals and ambulance services. To ensure system reliability and security, features such as secure user authentication, encrypted password storage, session management, role-based access control, and input validation are implemented. By integrating location-based services with secure data management, the MedAlert system provides a practical solution that improves accessibility to essential medical resources and helps reduce delays during emergency situations.

Keywords: Real-Time Medicine Availability, Emergency Healthcare Services, Location-Based Services, Pharmacy Finder, Hospital Locator, Ambulance Services, Web-Based Application, Healthcare Information System, GPS Integration, Medicine Search System, Secure Authentication, Healthcare Accessibility, Emergency Response System, Flask Framework, SQLite Database

Introduction

The MedAlert – Real-Time Medicine Availability and Emergency Finder is a web-based application developed to help users quickly locate essential medicines and nearby healthcare services during emergency situations. The system allows users to search for medicines and identify nearby pharmacies, hospitals, and ambulance services through a simple and user-friendly interface. By providing quick access to critical healthcare information, the application aims to reduce delays in medical assistance.

In many emergency situations, people face difficulties in finding required medicines or identifying nearby healthcare facilities. Traditional methods such as visiting multiple pharmacies or contacting hospitals individually are time-consuming and inefficient. The lack of a centralized platform that provides accurate information about medicine availability and emergency services can lead to delays in treatment and increased stress for patients and caregivers.

To address this problem, the proposed MedAlert system integrates medicine search functionality with location-based healthcare service identification. The system provides users with information about medicine availability in nearby pharmacies along with details of hospitals and ambulance services. By combining efficient data management, location-based services, and a user-friendly interface, the system aims to improve accessibility to healthcare resources and support users during critical medical situations. Remaining sessions are divided into literature review, proposed work, result are given and discussed and last concluded with future work.

Literature Review

1. Developed ProMED, an Android-based application using location tracking and Google Maps API to identify nearby pharmacies. The system employs Angular for backend development and MongoDB for data storage. Testing with data from over 20 medical stores demonstrated improved access to essential medicines.

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2. Accessing healthcare services is often time-consuming due to fragmented platforms for doctor consultations, appointments, medicine ordering, and lab tests, which is critical during emergencies. To overcome this challenge, researchers proposed Health Finder, a cross-platform mobile application integrating multiple healthcare services into a single platform. The system includes secure authentication, real-time updates, and data protection mechanisms. Its modular design ensures ease of navigation and centralized service management.
3. Patients frequently experience difficulties in locating required medicines at nearby pharmacies due to the absence of real-time information on availability, pricing, and expiry details. To address this issue, a system was developed using Flutter and Django with integrated geolocation services. The Haversine formula is used for distance calculation, while Cosine Similarity recommends alternative medicines. A Gemini AI-powered chatbot assists users, supported by a secure backend for inventory and order management.
4. Patients often face difficulties in locating required medicines during emergencies due to the absence of real-time stock information, while pharmacies struggle with efficient inventory management. To address these challenges, prior research proposed systems integrating GPS-based location services with the Haversine formula. Cosine Similarity techniques are used to recommend alternative medicines when required drugs are unavailable. Gemini AI-powered chatbots further enhance user interaction and support.
5. presented an Android-based application was developed using Java, Eclipse IDE, and the Android SDK. Google Maps API was integrated for navigation and hospital search. Data collected through hospital surveys formed a reliable core dataset for the system.
6. During medical emergencies, patients and families often face confusion in selecting the appropriate hospital due to limited access to real-time hospital information. To overcome this issue, researchers developed an Android-based system using Android Studio and Firebase for real-time data synchronization. The application integrates Google Maps API for navigation and provides features such as emergency ambulance alerts, hospital search, doctor listings, lab test details, and medicine information.
7. During medical emergencies, patients struggle to choose an appropriate hospital due to factors such as distance, service availability, and quality of care. To support effective decision-making, studies applied fuzzy logic and multi-criteria decision-making techniques. Methods such as AHP and TOPSIS were used to rank hospitals based on criteria including distance, cost, specialization, and emergency readiness. These approaches improve hospital selection accuracy in critical situations.
8. Patients frequently face difficulties in accessing the nearest or most suitable hospitals during emergencies due to the absence of centralized real-time healthcare information. To address this issue, systems integrating GPS-based geolocation and Google Maps API were developed for accurate navigation. Firebase databases provide real-time updates on bed availability and specialist information. Android-based testing ensured accessibility, compatibility, and data accuracy.
9. Traffic congestion and the absence of real-time routing significantly delay patient transportation to hospitals, while unidentified patients create challenges in emergency situations. To address these issues, an Android-based system integrating GPS and Google Maps API was proposed for efficient routing. Firebase supports real-time data storage, while HAAR and LBPH machine learning techniques enable patient identification. The system also facilitates automated family alerts.
10. Access to healthcare during emergencies is often delayed due to the lack of real-time hospital information and navigation support. To address this challenge, prior research developed systems integrating GPS and Google Maps APIs for accurate hospital location and routing. A client-server database provides real-time updates on bed availability and specialist details. The Android-based application was tested for unit, compatibility, and location accuracy to ensure robust performance.

Methodology

The proposed system, MedAlert – Real-Time Medicine Availability and Emergency Finder, is a web-based application designed to help users quickly locate essential medicines and nearby healthcare services. The system allows users to search for medicines and view their availability in nearby pharmacies, while also identifying nearby hospitals and ambulance services using location-based functionality. A secure user authentication system is implemented to ensure safe access, along with features such as encrypted password storage, input validation, session management, and role-based access control. By integrating medicine search with location-based healthcare services, the system provides a reliable and efficient solution to support users during emergency medical situations.

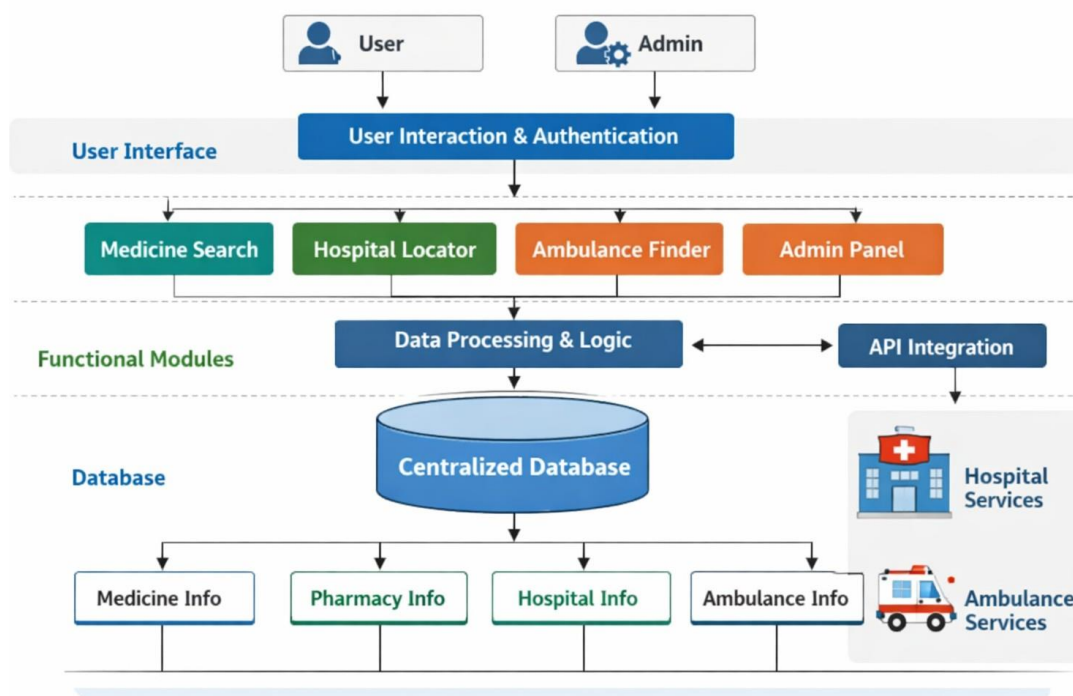


Figure.1. MedAlert Framework for Emergency Finder

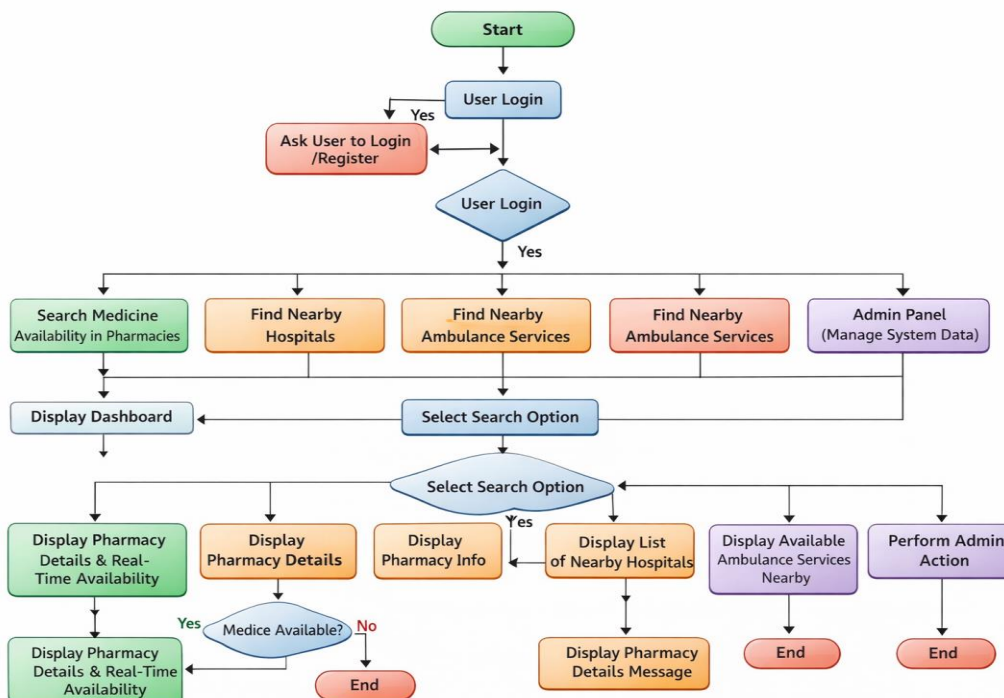


Figure.2. System Flow Diagram

The implementation of the MedAlert system follows a structured workflow to ensure efficient development and system functionality. First, the system environment is set up using the required tools, programming languages, and frameworks. Next, the database is designed to store information about users, medicines, pharmacies, hospitals, and ambulance services. After database creation, the user interface is developed to provide a simple and user-friendly platform for users to search medicines and access emergency services. The backend logic is then implemented to handle medicine search, location-based service identification, and data retrieval from the database. Security features such as user authentication, encrypted password storage, input validation, and

role-based access control are integrated to protect system data. Finally, the system is tested to verify functionality, performance, and security before deployment.

The MedAlert system uses structured data stored in a relational database to provide information about medicines and nearby healthcare services. The data includes medicine details, pharmacy information, hospital locations, and ambulance service contacts. These records are maintained by the system administrator to ensure accurate information and allow the system to quickly retrieve results when users search for medicines or emergency services.

The MedAlert system requires a computer or laptop with a minimum Intel Core i3 processor, 4 GB RAM, and sufficient storage to support development and execution. The application is developed using Python with the Flask framework for backend development. The user interface is designed using HTML and CSS, and SQLite is used as the database management system. Visual Studio Code (VS Code) is used as the development environment. The system can run on operating systems such as macOS, Windows, or Linux, and a modern web browser like Google Chrome, Safari, or Mozilla Firefox is required to access and test the application.

Result and Discussion

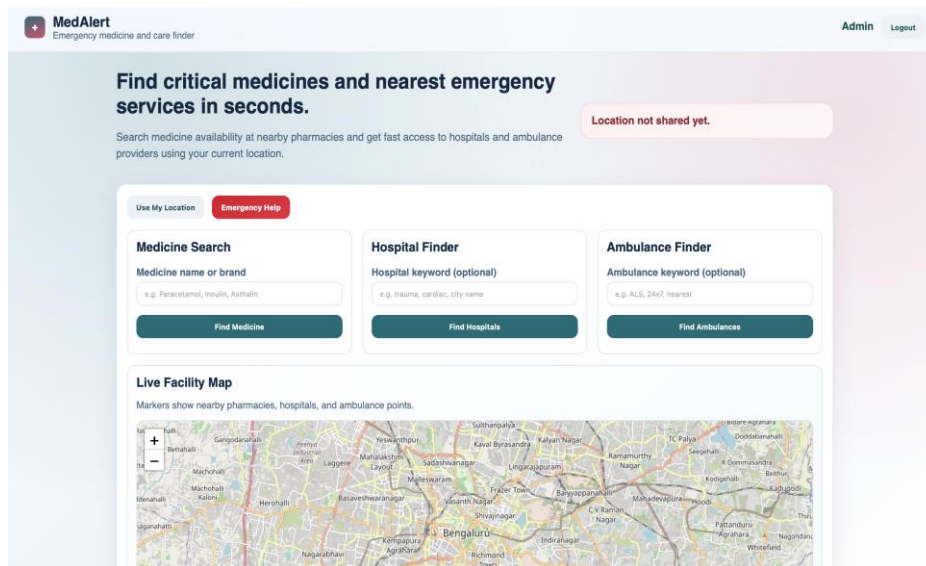


Figure 3. Medicine Emergency Search

Figure.3. shows the user interface of the MedAlert web application designed to help users quickly locate essential medicines and nearby emergency healthcare services. The system provides search options for medicines, hospitals, and ambulance services through a simple and user-friendly interface. It also includes a location-based feature that allows users to find nearby facilities using their current location. Additionally, a live facility map visually displays nearby pharmacies, hospitals, and ambulance points for quick access during emergency situations.

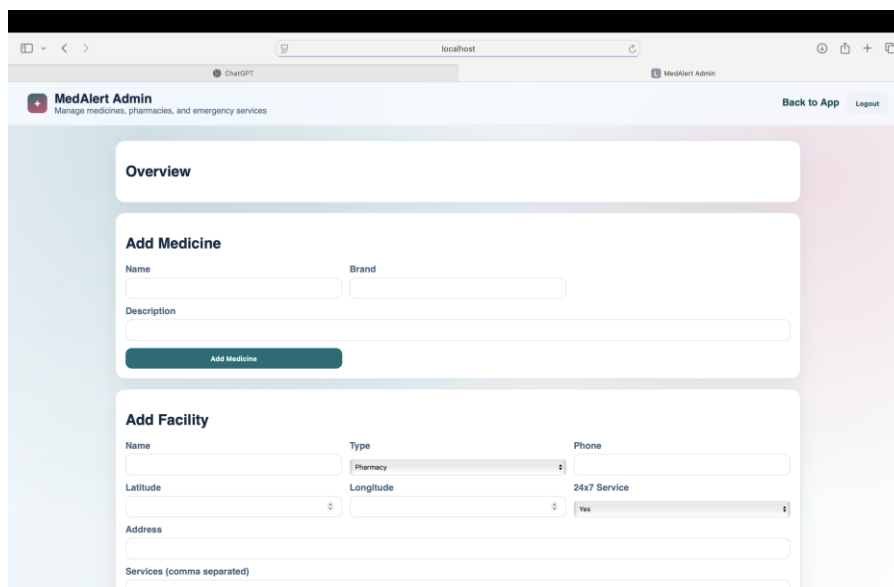
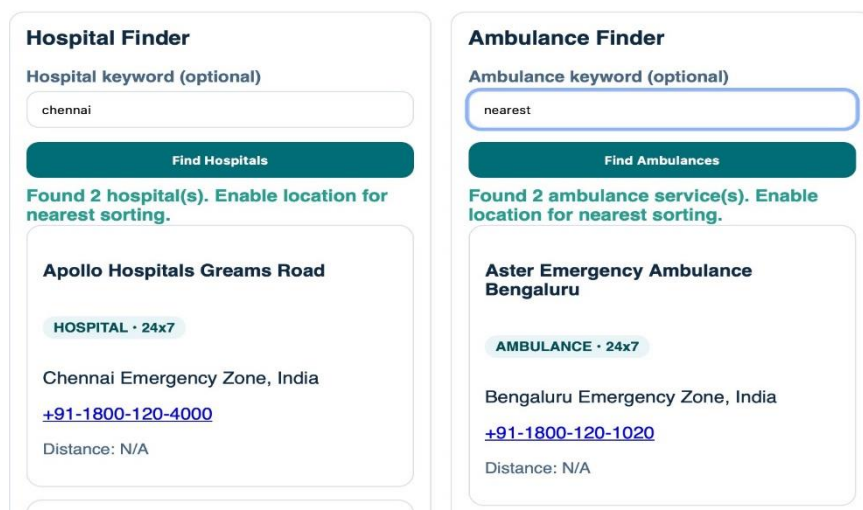


Figure.4. Overview Framework Result

The Figure 4, Overview Framework Result of the MedAlert system, which allows administrators to manage medicines and healthcare facility information. Through this interface, the admin can add new medicines with details such as name, brand, and description. It also provides options to add and manage facilities like pharmacies, hospitals, and ambulance services along with their location and contact details. This module ensures that the system database remains updated and accurate for users searching for medical resources.



The screenshot displays two side-by-side search interfaces. The left panel, titled 'Hospital Finder', has a search bar with 'chennai' entered and a 'Find Hospitals' button. Below the button, it states 'Found 2 hospital(s). Enable location for nearest sorting.' and lists 'Apollo Hospitals Greams Road' with details: 'HOSPITAL · 24x7', 'Chennai Emergency Zone, India', '+91-1800-120-4000', and 'Distance: N/A'. The right panel, titled 'Ambulance Finder', has a search bar with 'nearest' entered and a 'Find Ambulances' button. Below the button, it states 'Found 2 ambulance service(s). Enable location for nearest sorting.' and lists 'Aster Emergency Ambulance Bengaluru' with details: 'AMBULANCE · 24x7', 'Bengaluru Emergency Zone, India', '+91-1800-120-1020', and 'Distance: N/A'.

Figure.5. Emergency Tracer

Conclusion

The web based MedAlert system was developed to provide a reliable and efficient solution for locating essential medicines and nearby emergency healthcare services. The application successfully integrates medicine search functionality with location-based identification of pharmacies, hospitals, and ambulance services. By providing a user-friendly interface and secure access mechanisms, the system helps users quickly obtain critical healthcare information during emergency situations. The implementation of security features such as authentication, input validation, and role-based access control further improves the reliability and safety of the application. Overall, the MedAlert system demonstrates how web-based technologies can be effectively used to improve accessibility to medical resources and support users during urgent healthcare needs. The MedAlert system depends on data updated by the administrator, so outdated information may affect accuracy. It also requires internet connectivity and location services to function properly. Additionally, the system only provides information from facilities stored in its database and may not cover all healthcare centers. In future integrating real-time data updates from pharmacies and healthcare providers for better accuracy. A mobile application and features such as online medicine booking and direct ambulance requests can further enhance usability. Expanding the database and adding real-time notifications can make the system more effective and reliable.

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Conflicts of interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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