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Local Disaster Alert Sharing System

Santhosh P[1], Surya Prakash R[2], Tharanish E[3], Thomas A[4], Dr. Esther T[5]

[1-4] Student, [5]Guide

Department of Information Technology, Bachelor of Technology, Sri Shakthi Institute of Engineering And Technology (Autonomous), Coimbatore, India

Email ID: ***tharanish.ev@gmail.com***

ABSTRACT

The Local Disaster Alert Sharing System is a web-based application designed to provide timely disaster information to people in a specific locality. It helps users share and receive alerts about natural disasters such as floods, cyclones, and earthquakes, and enables them to report emergency situations in their surrounding areas. By providing location-specific alerts, the system improves community awareness and supports faster communication during disaster situations.

The system allows users to enter their location and view disaster alerts relevant to that area. An administrator can verify reports and manage disaster-related information, which helps keep the shared content reliable. The application is developed using HTML, CSS, and JavaScript for the frontend, Python Flask for backend processing, and MySQL for database management. Its simple interface lets people access local alert information without advanced technical knowledge.

The Local Disaster Alert Sharing System aims to reduce communication delays, encourage community participation in disaster preparedness and response, and improve public safety. It is intended to complement official warning systems rather than replace them. Future improvements can include additional verified alert sources, better location accuracy, and notification channels such as SMS and email.

Keywords: *Local Disaster Management, Emergency Alerts, Location-Based Notifications, Disaster Preparedness, Community Safety, Alert Sharing System.*

1. INTRODUCTION :

Natural disasters such as floods, cyclones, and earthquakes can cause significant damage to human life and property. Timely access to reliable disaster information is essential for public safety and emergency preparedness. Traditional warning methods may not always provide information specific to a user's locality.

The Local Disaster Alert Sharing System is a web-based platform for accessing disaster alerts relevant to a selected location. It uses HTML, CSS, JavaScript, Python Flask, and MySQL, and focuses on improving access to local disaster information and promoting community awareness. It is intended to complement official disaster warning systems and support better disaster preparedness.

The main objectives are to present location-specific alerts in one easy interface, to let residents share information about emergencies in their surroundings, to let an administrator verify reports, and to encourage community participation in disaster preparedness and response.

2. LITERATURE REVIEW :

Existing disaster warning systems use television, radio, official websites, and mobile notifications to communicate information about emergencies. These methods help disseminate warnings, but users may need to consult several sources to find information relevant to their locality. Delays in accessing updates and difficulty identifying location-specific information can affect disaster preparedness.

Studies on community-based early warning systems highlight the importance of involving local people in the warning process and of making sure that warnings actually reach those at risk [1], [2]. Work on the last mile of warning delivery, such as during Cyclone Titli in Andhra Pradesh, shows that communication at the community level is as important as the technical forecast [3]. International frameworks also treat early warning as a core element of disaster risk reduction and call for warnings that are accessible to everyone [4], [6].

Based on these ideas, the Local Disaster Alert Sharing System is developed to organize alerts according to the user's selected location in one centralized platform. The research gap will be established by comparing the system with existing alert platforms in terms of location-based filtering, information accessibility, and integration of external alert sources.

3. METHODOLOGY :

First, the user enters a location into the application. The system processes the request, retrieves the available disaster alerts, applies location-based filtering, and displays the relevant information. Reports submitted by users are passed to the administrator for verification. The application is built using a three-layer structure:

- **Frontend:** HTML, CSS, and JavaScript handle the user interface.
- **Backend:** Python Flask processes requests and applies location filtering.
- **Database:** MySQL stores alerts, reports, and administrator-managed information.

The actual alert retrieval depends on the external sources and integration mechanisms implemented in the application. Fig. 1 shows the overall architecture, and Table 1 summarizes the role of each layer.

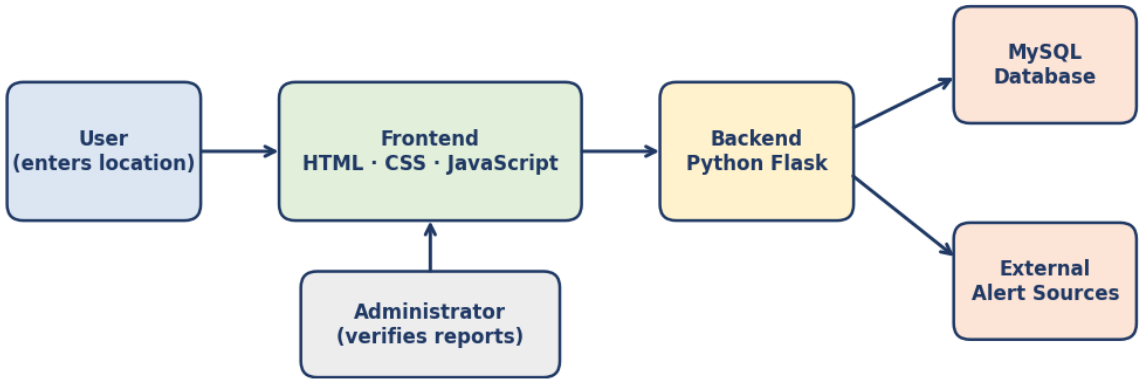


Fig. 1 - System architecture

Table 1. Layers of the system

Layer	Technology	Responsibility
Frontend	HTML, CSS, JavaScript	Accepts the location input and presents alerts and reports.
Backend	Python Flask	Handles requests, filters by location, and talks to external sources.
Database	MySQL	Stores alerts, reports, and administrator-managed data.

4. CONTENT :

The Local Disaster Alert Sharing System includes several important modules:

- **Location Input Module:** Allows users to enter or select their location.
- **Alert Retrieval Module:** Collects disaster alerts from external sources and the database.
- **Location Filtering Module:** Selects the alerts that match the chosen area.
- **Community Reporting Module:** Lets users report emergency situations around them.
- **Admin Verification Module:** Allows the administrator to verify reports and manage information.
- **Alert Display Module:** Shows alerts with their hazard, location, severity, and status.
- **Backend Module:** Processes application requests using Python Flask and MySQL.

All these modules work together to deliver relevant local disaster information to users.

5. RESEARCH AND REVIEWS :

Research on early warning systems shows that location-specific, easily understood warnings help communities respond in time, and that community engagement improves the usefulness of warnings [1], [2]. Guidance from international bodies stresses that early warning should be people-centred and accessible [4], [5], [6].

Based on these studies, this project is developed to make local disaster information easier to find and to involve the community in sharing it, while relying on administrator verification to keep the information dependable.

6. RESULTS & DISCUSSION :

The Local Disaster Alert Sharing System provides a web-based approach to accessing disaster information relevant to users' selected locations. The dashboard in Fig. 2 presents active alerts, shelters, reports, and a live alert feed with hazard, location, severity, and status.

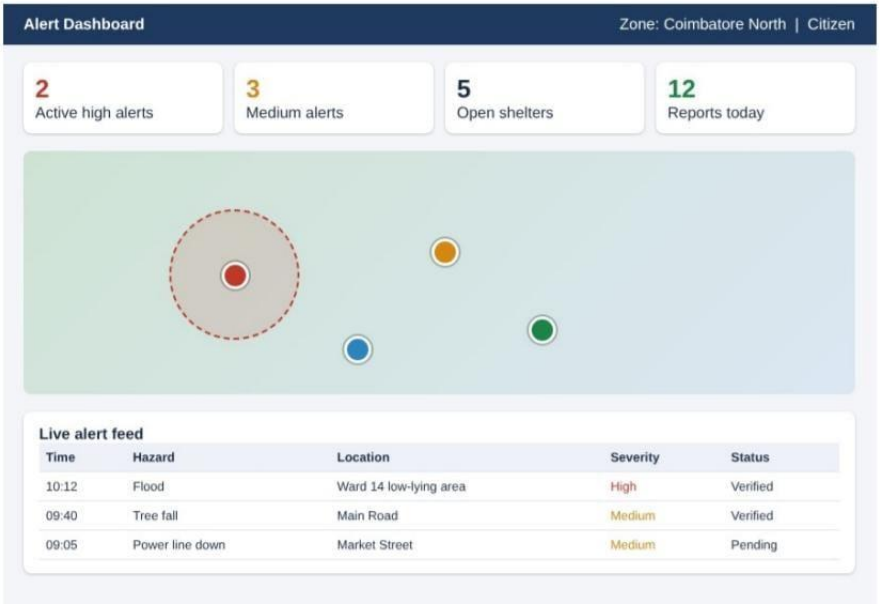


Fig. 2 - Alert dashboard

The prototype should be evaluated through functional testing of location input, alert retrieval, and the presentation of relevant information, including cases with unavailable data sources or no matching alerts. The planned tests are listed in Table 2, and their outcomes are to be recorded from the implemented system.

Table 2. Planned functional test cases

ID	Test scenario	Expected behaviour	Result
T1	Valid location entered	Alerts relevant to the location are displayed.	To be recorded
T2	Location with no alerts	A clear "no alerts" message is shown.	To be recorded
T3	External source unavailable	The application handles the failure without crashing.	To be recorded
T4	Community report submitted	The report is stored and sent for administrator review.	To be recorded
T5	Administrator verifies report	Verified status appears in the alert list.	To be recorded

The effectiveness of the system depends on the availability and reliability of external alert sources, the accuracy of location matching, and internet connectivity. Incorrect or delayed information may reduce the usefulness of alerts. The system is intended to complement official disaster warning services.

7. CONCLUSION :

The Local Disaster Alert Sharing System is a web application that helps people receive and share location-specific disaster information. Built with HTML, CSS, JavaScript, Python Flask, and MySQL, it centralizes alerts, supports community reporting, and uses administrator verification to keep information reliable.

Overall, the project encourages community participation in disaster preparedness and contributes to safer, better-informed local communities.

8. FUTURE SCOPE :

The system can be improved further in many ways:

- Integration of additional verified alert sources
- SMS, email, and push notifications
- Improved location accuracy using maps and GPS
- Multi-language support
- Mobile application
- Comprehensive performance and usability testing

These improvements can make the system more accurate, reliable, and useful for communities.

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