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AI Based Fault Detection and Predictive Maintenance System

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ABSTRACT :

Community safety is an important concern in residential areas, public places, and urban environments. However, reporting incidents and coordinating assistance can involve delays and difficulties in sharing accurate information. This paper presents AegisNet – Community Safety and Incident Coordination System, a web-based platform designed to support incident reporting and community safety coordination. The proposed system provides user interfaces for accessing the platform, managing profiles, and viewing the member dashboard. The system includes a landing page, community safety hub, email sign-in, account settings, profile management, and dashboard interfaces. These components provide a structured environment for organizing community safety information and supporting incident-related activities. By integrating accessible web interfaces with a coordinated reporting approach, AegisNet aims to improve information sharing, simplify incident management, and support community awareness. The system can be further enhanced through verified location services, evidence uploads, volunteer coordination, and real-time incident tracking.

INTRODUCTION

Community safety plays an important role in residential areas, educational institutions, public places, and urban environments. Timely incident reporting and effective coordination are essential for addressing safety concerns and supporting community members. However, delays in communication and difficulties in sharing accurate information can affect the response process.

Traditional incident reporting often depends on manual communication and separate reporting channels. Collecting incident details, identifying locations, sharing supporting evidence, and coordinating assistance can become difficult when multiple incidents require attention.

The proposed AegisNet – Community Safety and Incident Coordination System aims to provide a centralized platform for supporting community safety and incident management. The system includes a landing page, Community Safety Hub, email sign-in, account settings, profile management, and a member dashboard. These components provide an organized interface for accessing the platform and managing user information.

The main objective of this project is to simplify incident reporting, improve information sharing, support community coordination, and provide an organized approach to safety management. Future enhancements may include improved location services, evidence uploads, volunteer coordination, and real-time incident tracking.

OBJECTIVE

- To develop a digital platform for community safety and incident coordination.
- To enable users to report community incidents with relevant details and supporting evidence.
- To identify and organise incidents based on categories, locations and status.
- To facilitate coordination between users, volunteers and administrators.
- To maintain incident records and track the progress of submitted reports.

LITERATURE SURVEY

1.Goh, Goh and Baccay developed a community-based disaster risk reduction and management information system for supporting disaster preparedness and response. Their work focused on community information management, emergency operations and coordinated access to essential disaster-related information.

2. Researchers investigating GIS and GPS-based emergency response systems explored the integration of geographic information, emergency locations and responder tracking. Their work demonstrated how location-based information and route management can support emergency coordination and improve awareness of incident locations.

3. Nielsen, Landwehr, Nicolaï, Patil and Raju reviewed social media and crowdsourcing in disaster risk management. Their study analysed research trends and highlighted how information contributed by the public can support disaster preparedness and response while identifying challenges related to implementation and reliability.

4. Mehta, Bruns and Newton investigated trust in social media information used for disaster management. Their work examined information gathering, verification and crowdsourcing approaches, highlighting the importance of evaluating user-submitted information before using it to support emergency response decisions.

5. Wiegmann and colleagues reviewed opportunities and risks associated with using social media data for incident information. Their research examined how citizen-generated information can support incident assessment, volunteer coordination and information collection while identifying limitations caused by incomplete or unreliable reports.

METHODOLOGY:

1. **Incident Reporting and Submission:** Users access the AegisNet web application to report community incidents by entering relevant descriptions, selecting incident categories, and providing available location details and supporting evidence.
2. **Incident Classification and Prioritization:** Submitted incidents are organised according to their categories and reported severity. This classification helps users and authorised personnel identify different community issues and understand which reports may require urgent attention.
3. **Location-Based Incident Mapping:** Location information is associated with submitted reports to help identify where incidents have occurred. Where supported, GPS and Google Maps integration can assist users in identifying incident locations and viewing reported community issues geographically.
4. **Volunteer Coordination and Response:** Authorised volunteers can review available incident information and communicate their response status. This process supports coordination between reporters, volunteers, and administrators while helping users understand the progress of reported incidents.
5. **Verification and Monitoring:** Administrators review submitted incident details, monitor report statuses, and update records as incidents progress through the reporting workflow. Users can track available status updates, improving transparency and accountability throughout incident management.
6. **Data Management and Security:** Incident records, user information, categories, and status updates are maintained through the application's data management layer. Authentication and role-based access help restrict information and administrative functions to authorised users. The specific database, backend framework, and security implementation should be documented according to the actual project configuration.

EXISTING SYSTEM:

1. **Manual Incident Reporting:**

Community incidents are often reported through phone calls, messaging applications, or informal communication channels.

2. **Delayed Incident Coordination:**

Information may take time to reach the appropriate volunteers or administrators, delaying the review and handling of reported incidents.

3. **Difficult Incident Tracking:**

Users may find it difficult to determine whether their reported incidents have been acknowledged, reviewed, or resolved.

4. **Risk of Missing Information:**

Reports shared through informal channels may contain incomplete descriptions, inaccurate locations, or insufficient supporting evidence.

5. **Limited Centralized Monitoring:**

Incident details, response updates, and communication records may be distributed across different platforms, making management difficult.

6. **Scalability Problem:**

Managing increasing numbers of community incidents becomes challenging when records, updates, and responses are handled manually.

PROPOSED SYSTEM:

1. **Centralized Incident Reporting:** AegisNet provides a digital platform for users to submit community incident reports with descriptions, categories, locations, and supporting evidence.
2. **Incident Management Hub:** A centralized incident management area enables authorised users to review submitted reports, organise incident details, and monitor report statuses.
3. **Location-Based Incident Mapping:** AegisNet helps identify incident locations using location details and map-based features, enabling users and authorised personnel to understand where incidents have occurred**.**
4. **Volunteer Coordination:** The system supports coordination between users and volunteers by making submitted incident information available to authorised responders for review and response.
5. **Incident Tracking System:** AegisNet allows users and authorised personnel to monitor incident progress through status updates, improving visibility from submission to resolution**.**
6. **Monitoring Dashboard:** The dashboard presents incident information in an organised view, helping authorised users review reports, monitor ongoing issues, and understand the current status of reported incidents.
7. **Administrative Control:** The administrative functions allow the authorised administrator to manage user and volunteer information, review incident reports, according to the system workflow.

SYSTEM REQUIREMENTS:

Hardware Requirements:

• Processor: Intel Core i3 or higher or equivalent.

• RAM: Minimum 4 GB; 8 GB recommended.

• Storage: 256 GB or higher.

• Display: Standard HD display or higher.

• Network: Stable internet connection for development and AI/API communication where applicable.

Software Requirements:

• Operating System: Windows 10/11, Linux or macOS.

• Frontend: HTML, CSS and JavaScript.

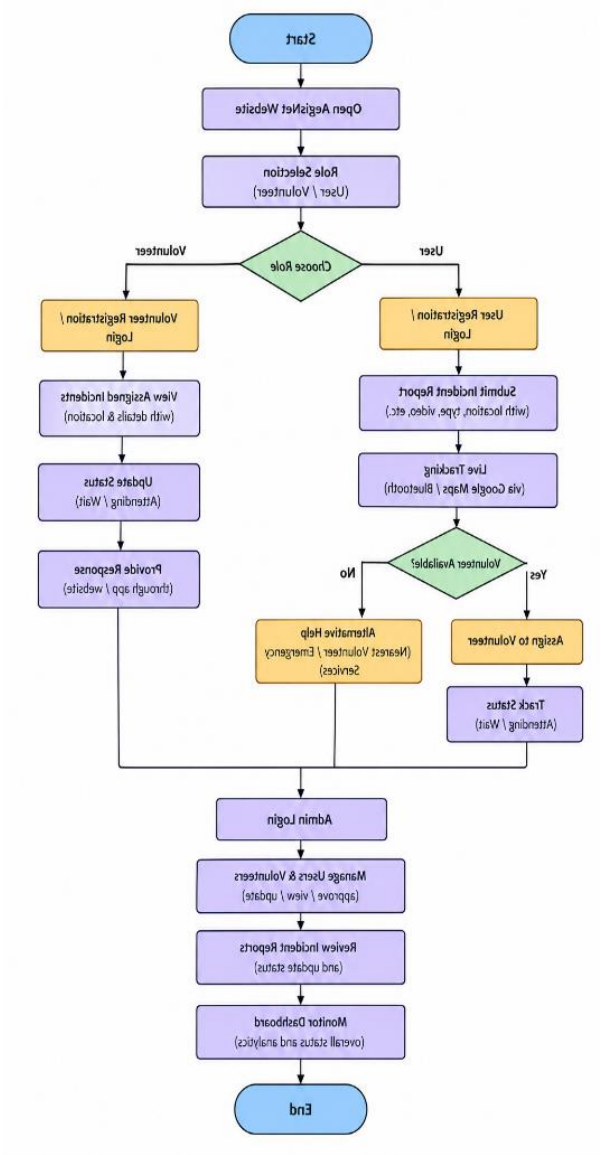
• Backend: Node.js and Express.js.

• AI Processing: Python with Artificial Intelligence and Natural Language Processing components.

• Database: MongoDB.

• Browser: Google Chrome, Mozilla Firefox or Microsoft Edge.

PROCESSING:



MODULES:

1. Requirement Management: Creates, stores, updates, and tracks software requirements throughout the project lifecycle.
2. Document Upload: Supports uploading and processing specification documents in PDF, DOCX, and TXT formats.
3. AI Requirement Extraction: Automatically extracts and classifies requirements from uploaded documents and assigns confidence scores to the extracted requirements.
4. Traceability Matrix (RTM): Establishes links between requirements, software design components, source code, and test cases to maintain complete traceability.
5. Impact Analysis: Identifies dependencies between requirements and analyzes the potential impact of requirement changes on related design components, code, and test cases.
6. Verification and Testing: Connects test cases with their corresponding requirements and tracks verification results and testing status.
7. Dashboard and Reporting: Displays project progress, requirement status, test coverage, traceability information, and comprehensive project reports.
8. User Management: Provides role-based access control for Admin, Manager, Developer, and Tester roles to ensure secure access to project resources.



Figure A2.1 Front page

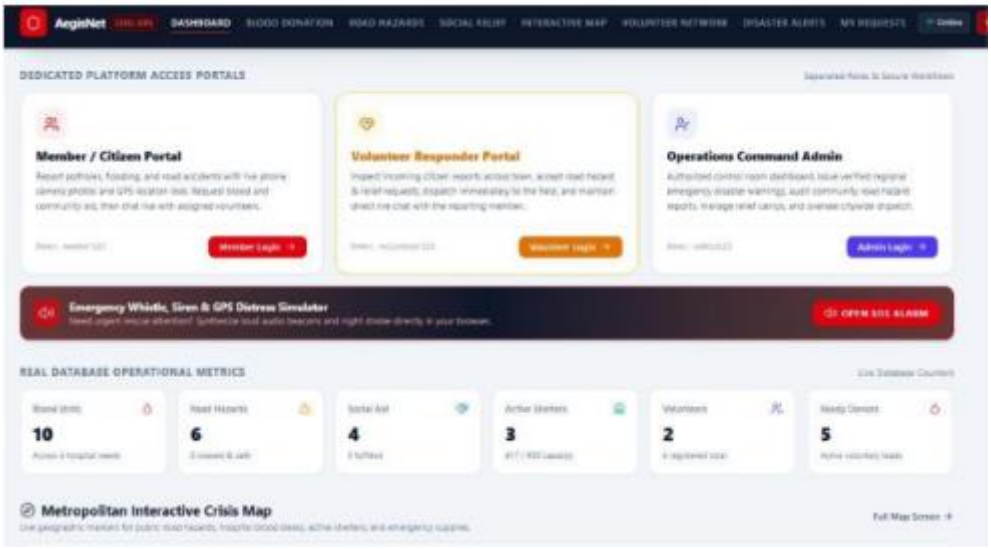


Figure A2.2 Dashboard

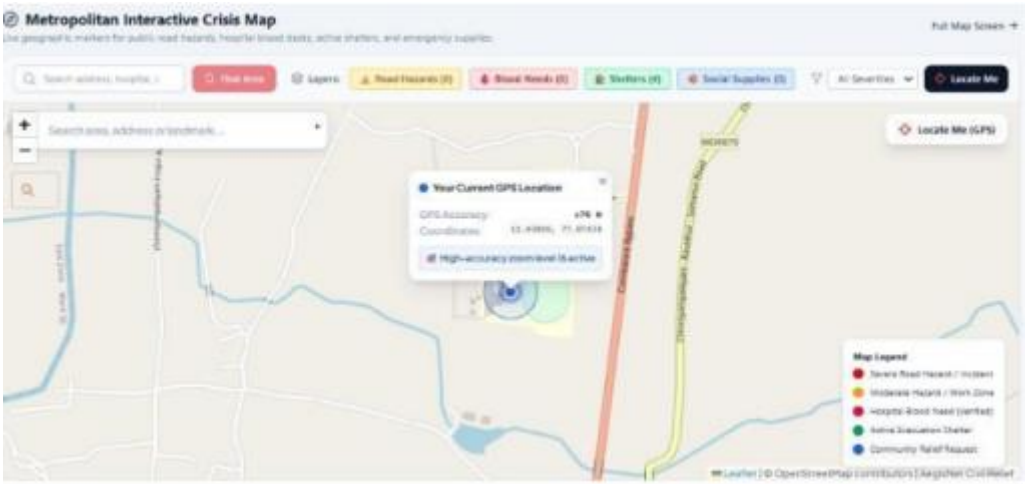
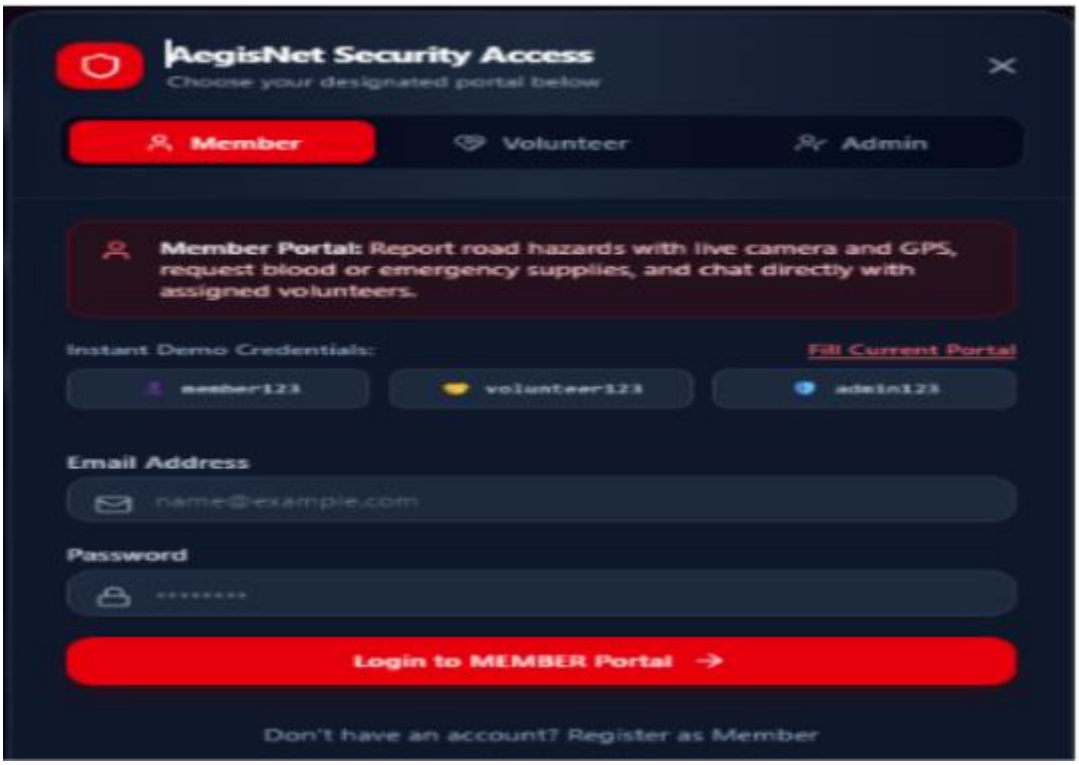


Figure A2.3 Map Integrattion



FigureA2.1login



Figure A2.5 Volunteer Page

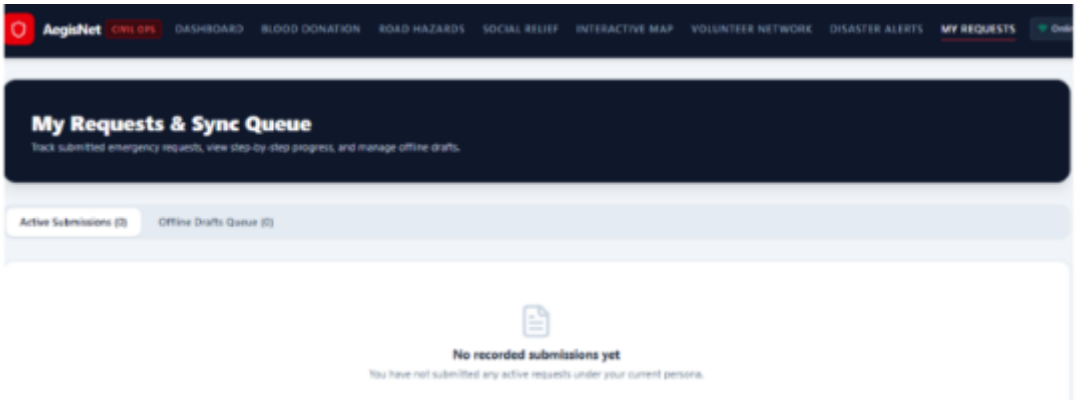
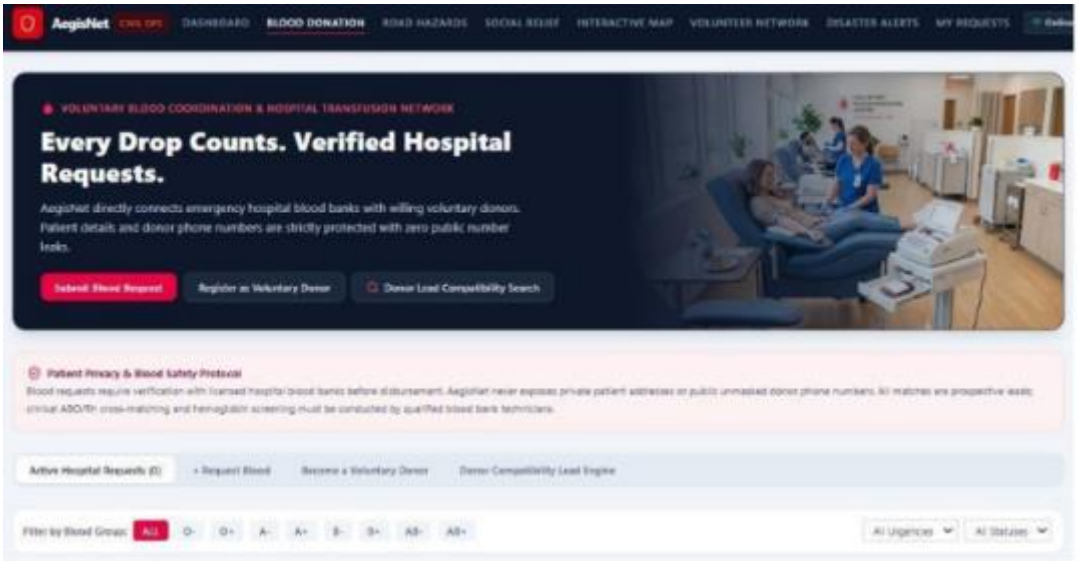


Figure A2.6 Reporting page



FigureA2.7BloodDonationPage

CONCLUSION

The AegisNet – Community Safety and Incident Coordination System provides a web-based approach to supporting community safety and incident management. The system includes a landing page, Community Safety Hub, email sign-in, account settings, profile management, and a member dashboard. These interfaces provide an organized environment for accessing the platform and managing user information. AegisNet aims to simplify incident reporting, improve information sharing, and support effective community coordination. The system establishes a foundation for further development of community safety services. In the future, GPS-based location services, image and video evidence uploads, volunteer coordination, real-time incident updates, and intelligent incident analysis can be incorporated to strengthen incident management and improve community safety.

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