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AUTOMATIC DISASTER WARNING SYSTEM USING AMAZON WEB SERVICE

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ABSTRACT

Automatic Disaster Warning System using AWS is designed to monitor environmental data, predict natural disasters, and issue real-time alerts to affected areas. The system leverages AWS Simple Notification Service (SNS) for instant communication and real-time data collection to track potential disaster indicators, such as earthquakes, floods, hurricanes, and wildfires. Built using HTML, CSS, and JavaScript, the system processes weather data and automatically triggers alerts to government agencies, emergency response teams, and citizens. This AWS-powered solution enhances disaster preparedness by ensuring timely warnings, minimizing potential losses, and improving public safety.

KEYWORDS

Amazon Web Services (AWS), AWS Simple Notification Service (SNS), IoT (Internet of Automatic Disaster Warning System, Things), Cloud-based Disaster Management.

INTRODUCTION

Natural disasters such as floods, earthquakes, cyclones, and wildfires pose serious threats to human life and infrastructure worldwide. Timely detection and early warning are critical for minimizing damage and improving emergency response. However, traditional disaster warning systems often suffer from delayed alerts, limited scalability, and unreliable communication channels. To address these challenges, this paper presents an Automatic Disaster Warning System using Amazon Web Services (AWS). The proposed system collects real-time environmental data from public weather sources and analyses it to detect potential disaster conditions. Upon identifying risk scenarios, automated alerts are generated and disseminated through AWS Simple Notification Service (SNS). A web-based interface developed using HTML, CSS, and JavaScript enables efficient access to alerts and emergency information. By leveraging cloud computing, the system ensures high availability, scalability, and rapid alert delivery.

LITERATURE SURVEY

Several studies have explored cloud-based disaster warning systems using AWS and IoT technologies. Existing approaches achieved real-time monitoring and improved prediction accuracy but were often limited to specific disaster types or required extensive sensor infrastructure. Machine learning–based methods enhanced analysis but lacked efficient public alert dissemination. Some systems integrated AWS SNS for notifications yet provided limited user interaction and visualization. The proposed system addresses these limitations by offering a scalable, multi-disaster warning framework with automated alerts and a web-based interface.

RELATED WORK

Various research efforts have investigated cloud-based disaster warning systems leveraging AWS and IoT technologies. Existing approaches enabled real-time monitoring and automated alerts but were often limited to specific disaster types or required extensive sensor infrastructure. Machine learning–based methods enhanced prediction accuracy; however, they lacked

efficient mechanisms for public alert dissemination. Some systems integrated AWS Simple Notification Service (SNS) for notifications yet offered limited user interaction and centralized alert management. The proposed system addresses these limitations by providing a scalable, multi-disaster warning framework with real-time alerts and an intuitive web-based interface.

EXISTING SYSTEM

Traditional disaster warning systems rely on manual monitoring and localized infrastructure to detect floods, earthquakes, cyclones, and wildfires. Data is collected from sensors or government monitoring stations, and alerts are sent via television, radio, sirens, or SMS, often with manual verification. These systems are usually limited to specific disaster types, lack cloud-based integration, and face delays in real-time data processing. Dependence on physical infrastructure reduces reliability during extreme events, while limited user interaction and centralized management restrict overall effectiveness. Furthermore, these systems often fail to provide timely and accessible information to all affected populations. Consequently, existing methods cannot provide comprehensive, automated, and multi-disaster warning solutions.

PROPOSED SYSTEM

The proposed Automatic Disaster Warning System using AWS provides real-time monitoring and alerting for floods, earthquakes, cyclones, and wildfires. It collects data from public weather sources and sensors, analyses it against predefined thresholds, and generates automated alerts via AWS SNS to government agencies, emergency responders, and citizens. A web-based interface allows users to access real-time alerts, historical data, and emergency helplines. AWS cloud infrastructure ensures scalability, high availability, and fault tolerance. By automating data collection, analysis, and notification, the system reduces delays, supports multiple disaster types, and improves disaster preparedness and public safety. Its scalable design handles large data and users. The centralized platform allows authorities to manage alerts efficiently and monitor disaster trends over time. Overall, this system enhances situational awareness

and facilitates timely decision-making during emergencies.

SYSTEM ARCHITECTURE

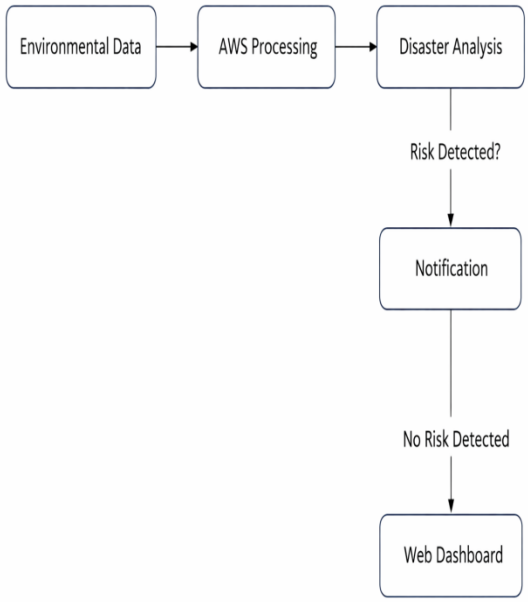


Fig 1: System Architecture

METHODOLOGY DESCRIPTION

Environmental Data (Data Collection): Collects real-time data from IoT sensors and public weather APIs, including temperature, rainfall, water levels, and seismic activity.

Data Processing: Uses AWS Lambda and S3 to clean, format, and store data for efficient analysis.

Disaster Analysis: Evaluates data against predefined thresholds to detect floods, earthquakes, cyclones, or wildfires.

Notification: Automatically sends alerts via AWS SNS through SMS, email, and mobile notifications to stakeholders.

Web Dashboard: Provides a centralized interface displaying real-time alerts, historical data, and emergency helplines for users and authorities.

RESULTS & DISCUSSION

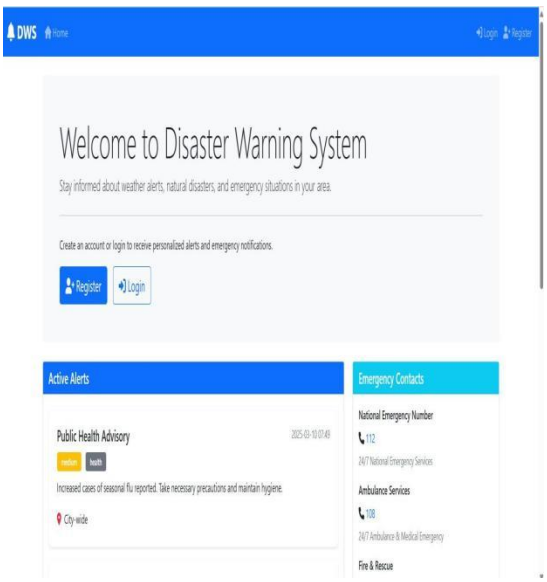


Fig 2: Home page

The Home Page of the Disaster Warning System (DWS) offers users quick access to real-time disaster alerts and emergency

information. Users can create an account or log in for personalized notifications.

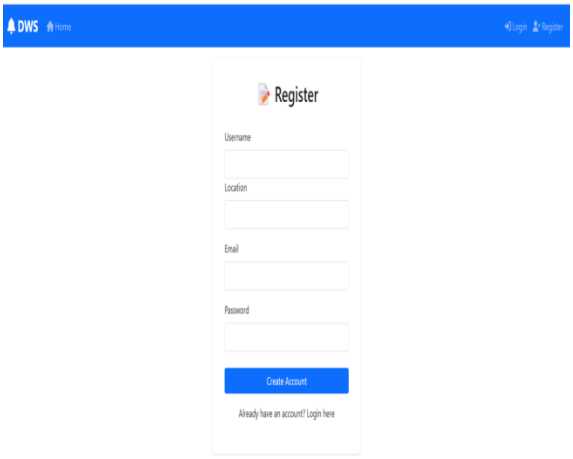


Fig 3: User Registration Page

The Register Page allows new users to create an account by entering their Username, Location, Email, and Password. Users can click Create Account to register or navigate to the login page if they already have an account. This enables access to personalized disaster alerts and emergency notifications.

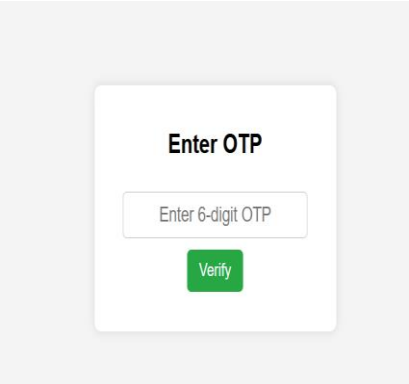


Fig 4: Verify OTP

The OTP Verification Page allows users to authenticate their account during registration or login. Users are prompted to enter the 6-digit OTP received via email or SMS and click the Verify button to complete verification.

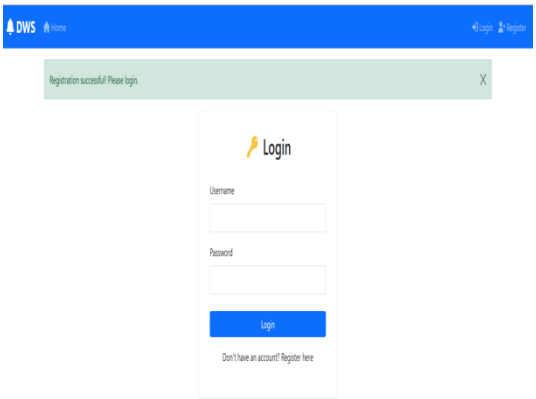
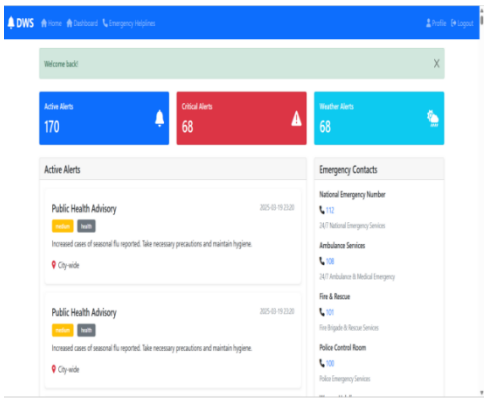


Fig 5: User Login Page

The Login Page allows registered users to access the Disaster Warning System by entering their Username and Password.

Fig 6: User Dashboard



The User Dashboard provides users with real-time updates on Active, Critical, and Weather Alerts. It also lists important Emergency Contacts for quick access to services like ambulance, fire, and police. Users can navigate the dashboard, view alerts, and access their profile to stay informed during disasters.

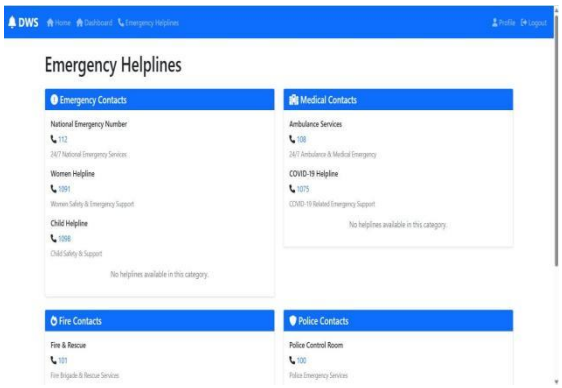


Fig 7: Emergency Helplines for User

The Emergency Helplines section provides users with quick access to essential contact numbers for immediate assistance during disasters. It includes national emergency services, ambulance, fire and rescue, and police control room numbers, ensuring users can reach help promptly in critical situations.

CONCLUSION

The Disaster Warning System predicts natural disasters like floods, earthquakes, and cyclones using real-time data and sends timely alerts via SMS, email, and the user interface. It provides early warnings to reduce risks, ensure public safety, and assist authorities and rescue teams in emergency response. The system enhances situational awareness and allows communities to take necessary precautions in advance. Overall, it helps save lives, minimize damages, and protect communities.

FUTURE SCOPE

The system can be enhanced with AI-powered predictive models for more accurate disaster forecasting. Integration of GPS-based tracking and automated evacuation guidance can improve emergency response. Additionally, blockchain can be used for secure, tamper-proof logging of alerts and user data.

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