

Citizen Grievance Redressal Platform With AI Prioritization

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Abstract—The Citizen Grievance Redressal Platform with Prioritization is designed to provide an efficient, transparent, and technology-driven solution for handling citizen complaints in smart governance systems. The platform enables users to register grievances online, track their status, and receive timely responses from concerned authorities. A key feature of the system is its prioritization module, which categorizes complaints based on urgency, severity, and impact using Natural Language Processing techniques for automated text categorization and sentiment analysis. This ensures that critical issues such as public safety or essential services receive immediate attention. The system architecture integrates user and admin modules, database management, and automated notification services to improve communication and accountability. By digitalizing the redressal process, the platform minimizes manual delays, enhances transparency, and promotes better interaction between citizens and government bodies. The project aims to create a scalable and user-friendly solution that strengthens trust in public service delivery and contributes to the development of smart city governance.

Index Terms—Artificial Intelligence, e-governance, grievance redressal, NLP, prioritization, web system.

I. INTRODUCTION

In today's fast-paced world, citizens expect faster and more efficient ways to report problems and seek solutions from government bodies. Traditional grievance redressal systems often face delays, lack of transparency, and ineffective handling of complaints due to manual processes and high volumes. To address these challenges, AI-powered Citizen Grievance Redressal Platforms have been developed. These platforms use Artificial Intelligence techniques like Natural Language Processing (NLP), Machine Learning (ML), and sentiment analysis to

automatically categorize, prioritize, and route complaints. This ensures that urgent issues are addressed quickly while improving transparency, accountability, and citizen satisfaction. Such systems not only enhance the efficiency of grievance management but also provide data-driven insights for better governance and public service delivery.

II. SYSTEM ARCHITECTURE

The system consists of the following main components, each performing a specific function to ensure smooth and efficient grievance handling:

- **Citizen Interface:**

This module allows users to submit complaints through a web-based platform. Users can enter complaint details, select categories, and upload supporting information if required. It also provides a tracking feature where users can monitor the status of their complaints in real-time.

- **Web Server:**

The web server acts as a central communication layer between all system components. It receives user requests, processes them, and forwards them to the appropriate modules. It ensures secure and efficient data transfer using standard communication protocols.

- **AI Processing Module:**

This is the core component of the system responsible for intelligent decision-making. It analyzes the complaint text using Natural Language Processing techniques such as keyword extraction and sentiment analysis. Based on these factors, the system assigns a priority score and categorizes the complaint automatically.

- **Database:**

The database stores all relevant information including complaint details, user data, priority levels,

timestamps, and status updates. It ensures data consistency, fast retrieval, and secure storage of information for future reference and analysis.

• Officer Dashboard:

This module is used by administrators or government officials to manage complaints. It displays complaints sorted by priority level, enabling authorities to focus on urgent issues first. Officers can update the status, take action, and mark complaints as resolved.

The workflow begins when a citizen submits a complaint through the interface. The web server receives the request and forwards it to the AI processing module. The AI module analyzes the complaint, assigns a priority level, and stores it in the database. The officer dashboard retrieves complaints based on priority, allowing authorities to address critical issues first. Once resolved, the system updates the complaint status and notifies the user.

III. MATH

The AI prioritization module assigns a priority score to each grievance based on multiple factors such as urgency keywords, category severity, and sentiment analysis score.

The priority score P is computed as

$$P = w_1U + w_2S + w_3C$$

where

U = urgency score from keyword detection

S = sentiment severity score

C = category importance weight

w_1, w_2, w_3 = weighting factors

The complaint classification probability is calculated using a softmax function

$$P(y_i|x) = \frac{e^{z_i}}{\sum_{j=1}^n e^{z_j}}$$

where

x_i = input complaint text

y_i = predicted category

z_i = model output score

These equations enable automatic categorization and prioritization of grievances in the system.

IV. UNITS

The proposed system is a software-based web application and primarily processes textual and temporal data rather than physical measurements.

• Complaint data is represented in text form and stored digitally in the database.

• Time-related values such as submission date, response time, and resolution duration are measured in seconds, minutes, or days.

• System metrics such as number of complaints, priority score, and category count are dimensionless numerical values.

• No physical SI or CGS measurement units are involved in system operation.

V. IMPLEMENTATION

The AI-Prioritized Citizen Grievance Redressal System is implemented using a combination of web development technologies and artificial intelligence techniques.

1. Frontend Development:

The user interface is developed using HTML, CSS, and JavaScript. It provides forms for complaint submission and dashboards for tracking complaint status. The design focuses on simplicity and accessibility.

2. Backend Development:

The backend is developed using Python with the Flask framework. Flask handles routing, request processing, and communication with the database and AI module.

3. Database Integration:

The system uses MySQL (or MongoDB) for storing complaint data. Each complaint includes fields such as complaint ID, description, category, priority score, status, and timestamps.

4. AI and NLP Integration:

The AI module is implemented using Python libraries

Steps involved in processing:

- Text cleaning (removing stopwords, punctuation)
- Tokenization of complaint text
- Classification into predefined categories
- Priority score calculation

5. Priority Assignment Logic:

The system assigns priority levels (High, Medium, Low) based on calculated scores. Complaints containing critical keywords or negative sentiment are given higher priority.

6. API Communication:

REST APIs are used to connect frontend and backend. JSON format is used for data exchange between modules.

7. Security Features:

Basic security measures such as input validation, authentication (if implemented), and data encryption are used to protect user information..

The implementation ensures that the system is efficient, scalable, and capable of real-time complaint processing.

Module	Description
Citizen Portal	Complaint submission & tracking
AI Module	Classification & priority
Database	Storage of grievances
Officer Dashboard	View & resolve complaints

VI. RESULTS AND DISCUSSION

The system improves efficiency by automatically prioritizing complaints.

Examples:

- Emergency complaints (e.g., accidents, water leakage) → High priority
- Infrastructure issues → Medium priority
- General complaints → Low priority

This reduces response time and ensures better resource allocation. The system also improves transparency as users can track complaint status.

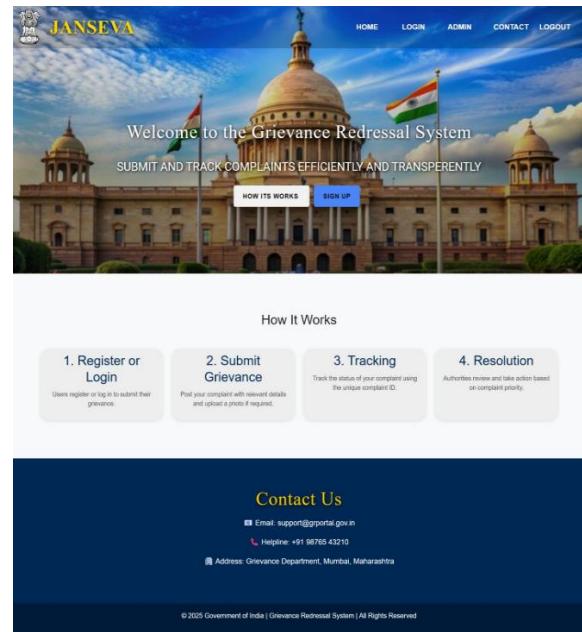


Fig. 1 Landing Page of website

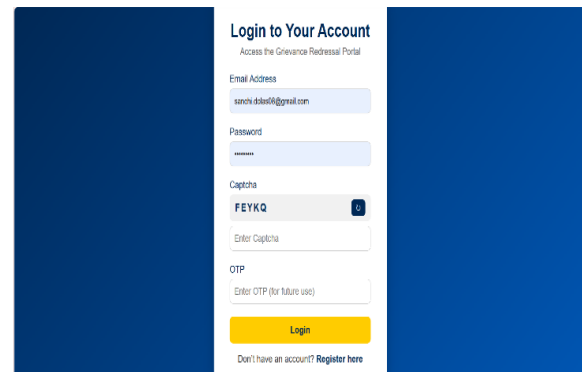


Fig. 2 Login Page

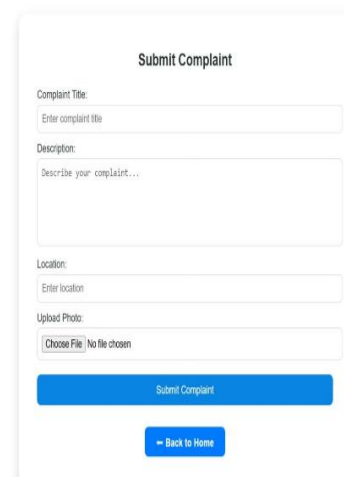


Fig. 3 Submit Complaint

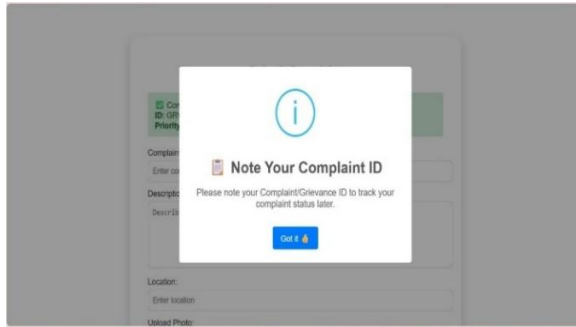


Fig. 4 Complaint Registered

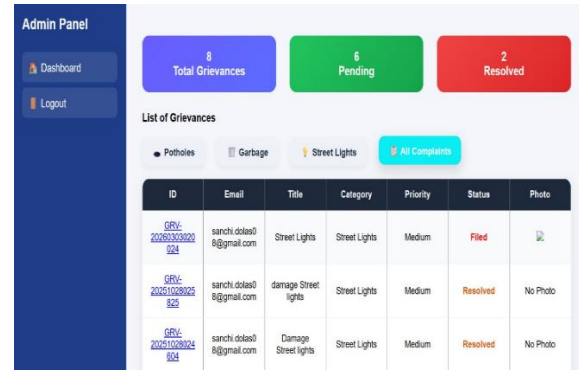


Fig. 8 Admin Dashboard

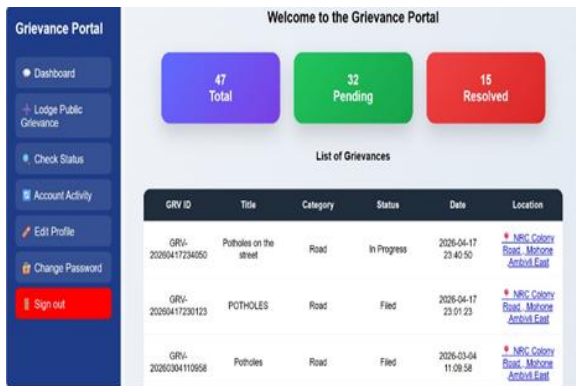


Fig. 5 User Dashboard

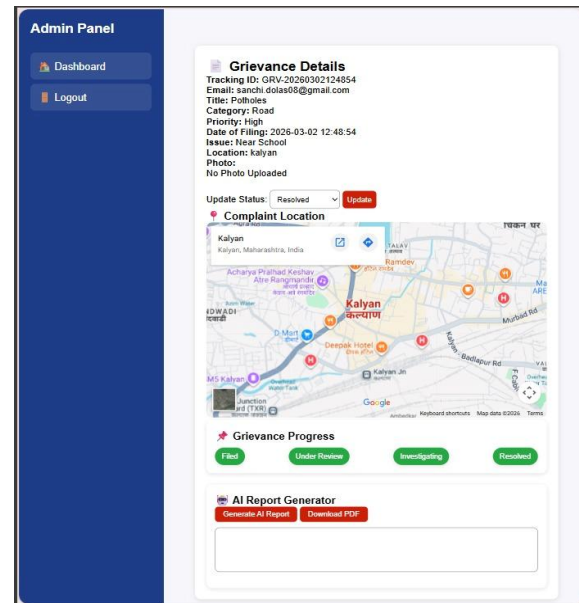


Fig. 8 Geo Location

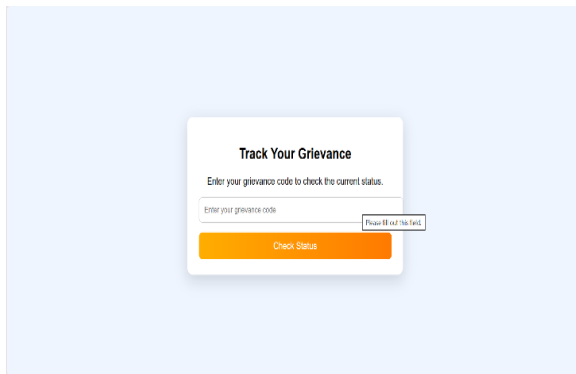


Fig. 6 Track Status

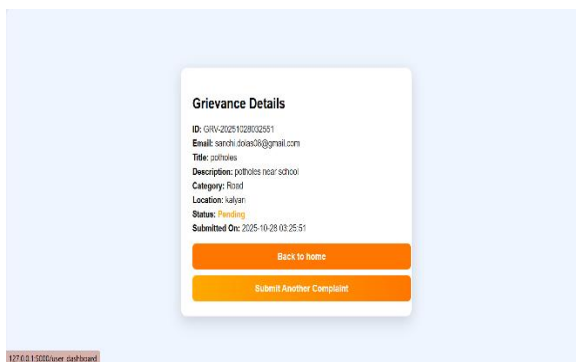


Fig. 7 Grievance Details

VII. CONCLUSION

The AI-Prioritized Citizen Grievance Redressal System provides an effective solution for handling public complaints. By using AI techniques, the system ensures that important issues are addressed quickly. It enhances efficiency, transparency, and accountability in governance systems. This project can be further improved by integrating real-time analytics and mobile applications.

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