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Smart Citizen Complaint and Resolution Platform using AI

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ABSTRACT: In the rapidly evolving concept of smart cities, efficient communication between citizens and government authorities plays a critical role in maintaining urban infrastructure. Traditional complaint management systems are often inefficient, time-consuming, and lack transparency. This paper proposes a Smart Citizen Complaint & Resolution Platform using Artificial Intelligence (AI) to automate and enhance the complaint handling process.

The system allows citizens to submit complaints through a user-friendly web interface developed using React. The backend system processes the complaint using Natural Language Processing (NLP) techniques to classify it into predefined categories such as sanitation, water supply, electricity, and road maintenance. Based on classification, the system assigns priority and forwards the complaint to the appropriate authority.

The proposed system improves response time, reduces manual effort, enhances transparency, and ensures better citizen engagement.

KEYWORDS- Artificial Intelligence, Smart City, Complaint Management System, React, Automation, NLP

I. INTRODUCTION

With increasing urbanization, cities are facing challenges in managing public services efficiently. Citizens frequently encounter issues such as garbage accumulation, potholes, water leakage, and electricity failures. Traditional complaint systems rely heavily on manual processes, leading to delays, inefficiencies, and lack of accountability.

The integration of Artificial Intelligence into complaint management systems can significantly improve efficiency by automating classification, prioritization, and routing of complaints. This project introduces a web-based platform that bridges the communication gap between citizens and municipal authorities, ensuring faster and more reliable issue resolution.

II. REVIEWS

P. Gupta et al. [1] (2025)– AI-Based Solution to Enable Ease of Grievance Lodging and Tracking for Citizens Across Multiple Departments Proposed an AI-based system that automates complaint lodging and tracking through NLP. Improved efficiency by auto-routing complaints to relevant departments. Demonstrated significant reduction in resolution time through digital automation

S. Nimase et al. [2] (2021)– Public Complaint Sorting for Smart City Using Image Processing Introduced an image-processing approach for sorting and categorizing civic complaints. Used computer-vision techniques to detect issues like potholes, waste, and streetlight failures. Enhanced accuracy when combined with textual complaint data Alam et al. [3] introduced a low-cost OMR system based on computer vision techniques. The method applies SSRN Technical Report [3] (2022)– AI-Driven Complaint Management System Focused on building an integrated AI framework using NLP and sentiment analysis. Highlighted complaint prioritization based on urgency and emotional tone. Showed improved user satisfaction and faster service delivery.



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Prasad Patil [4] (2021)– Civic Complaint Application under Smart City Project Developed a mobile application for complaint registration and tracking. Emphasized GIS-based location tagging and department wise routing. Highlighted the importance of user feedback integration for service improvement

F. Shama et al. [5] (2024)– A Complaint Distributive Mobile Application for Smart City Corporation Using Deep Learning Proposed deep learning models for automatic classification and prioritization of com plaints. Achieved high accuracy in detecting complaint categories from unstructured data

Pattamaporn Kormpho et al. [6] (2018)– Smart Complaint Management System Presented an early framework for e-governance complaint handling. Discussed role-based access and multi-level tracking mechanisms. Highlighted data centralization and accountability improvements through digital transformation.

K. Karren et al. [7] (2024)– Improving Conversational User Interfaces for Citizen Complaint Management Introduced chatbot-based interfaces for citizen interaction. Enhanced user experience through natural language conversations and guided complaint submission. Suggested integration with backend AI systems for faster resolutions.

III. PROPOSED METHODOLOGY

Based on the analysis of existing complaint management systems and smart city solutions, a consolidated AI-based methodology is proposed for efficient handling, classification, and resolution of citizen complaints. The methodology integrates web technologies, Natural Language Processing (NLP), and Machine Learning (ML) into a unified system capable of automating complaint processing and improving response efficiency. The proposed methodology is organized into sequential stages to ensure accuracy, scalability, and real-time performance.

Input Acquisition

The system accepts two primary inputs:

- Answer key provided by the examiner
- Scanned or camera-captured student answer sheets

Standard scanners or mobile devices are used, eliminating dependency on specialized OMR hardware.

Complaint Classification Using NLP

Natural Language Processing techniques are applied to automatically categorize complaints:

Feature extraction using methods such as TF-IDF or Bag of Words

Classification using Machine Learning algorithms such as Naïve Bayes, Logistic Regression, or Support Vector Machine

Mapping complaints into predefined categories such as:

- Sanitation
- Water Supply
- Electricity
- Road Maintenance

This automated classification reduces manual effort and improves accuracy in complaint routing.

Complaint Routing and Management

Once classified and prioritized:

Complaints are automatically forwarded to the relevant department

Each complaint is assigned a unique tracking ID

Authorities access complaints through an admin dashboard

This stage ensures efficient distribution and management of tasks

Status Tracking and Notification

The system provides real-time updates to users:

Complaint status updates (Pending, In Progress, Resolved)

Notifications via dashboard (or future SMS/email integration)

Transparent tracking mechanism

This improves user trust and engagement.



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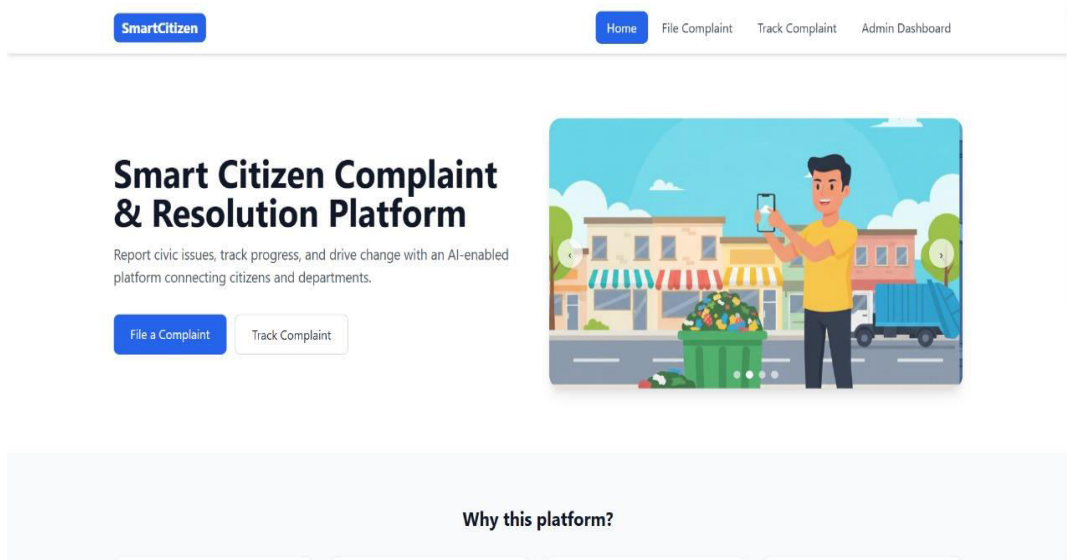
Methodology Outcome

The proposed methodology provides an end-to-end intelligent complaint management system. By integrating web technologies with NLP and ML techniques, it eliminates inefficiencies of traditional systems and ensures:

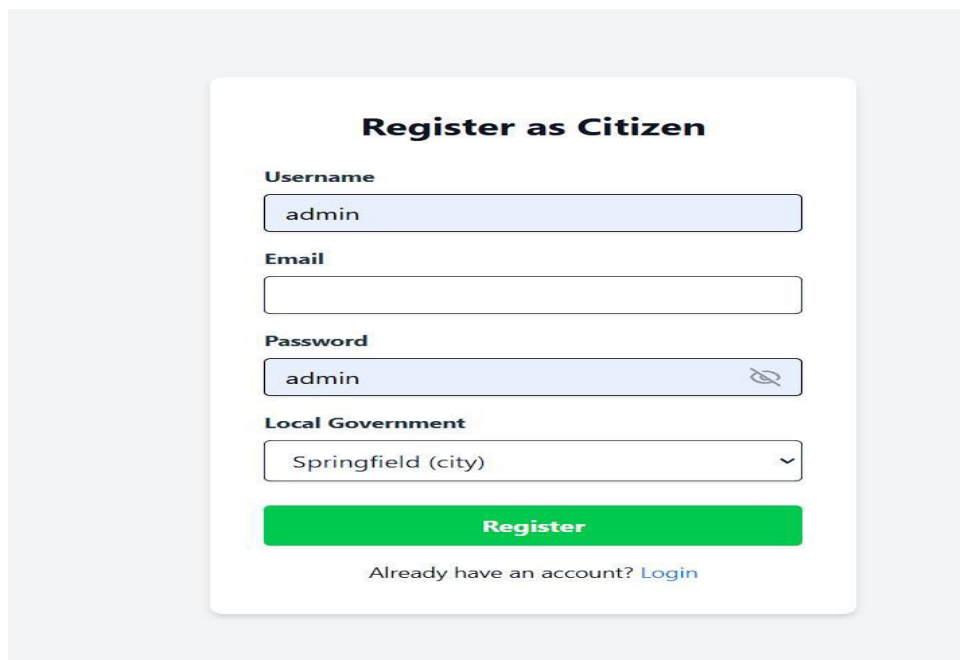
- Faster complaint resolution
- Automated classification and routing
- Improved transparency and accountability
- Scalable and adaptable smart city solution

IV. RESULTS & DISCUSSION

User Interface-



Citizen Dashboard –





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Complaint Dashboard -

The screenshot shows the 'Report an Issue' form in the Smart Citizen Citizen Portal. The form includes a title field with the example 'e.g., Pothole on Main Street', a description field with the prompt 'Please provide specific location details and the nature of the problem...', a category dropdown menu set to 'General', and an evidence photo upload section with a 'Choose File' button and the text 'No file chosen'. A 'Submit Complaint' button is at the bottom.

The screenshot shows the confirmation page for a submitted complaint. The title is 'Pothole on main street' with a 'SUBMITTED' status. Below the title, it says 'on main street' and '# Roads' with a date '25/1/2026'. There is a large black redaction box covering the main content area.

Super Admin Dashboard –

The screenshot shows the SuperAdmin Portal dashboard. It features a 'New Government Onboarding' section with a 'Start Onboarding Process' button and a 'Local Governments' section with a 'Government Officers' tab. Below the tab is a table with columns: ID, USERNAME / EMAIL, NAME, JURISDICTION, ROLE, and ACTION. The table currently displays 'No officers found.'



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The developed system provides separate dashboard interfaces for citizens and administrative authorities, demonstrating the practical implementation of the proposed AI-based complaint management framework. The citizen dashboard enables users to register complaints, submit issue descriptions, and track the status of their requests in real time. It provides a user-friendly interface that ensures easy interaction and transparency throughout the complaint lifecycle.

The admin dashboard allows authorities to view, manage, and resolve complaints efficiently. Administrators can analyze complaint trends and ensure timely resolution of issues. These interfaces validate the usability and real-time deployment capability of the system, supporting transparent communication, centralized complaint management, and efficient service delivery within a smart city environment.

Proposed Architectural Design

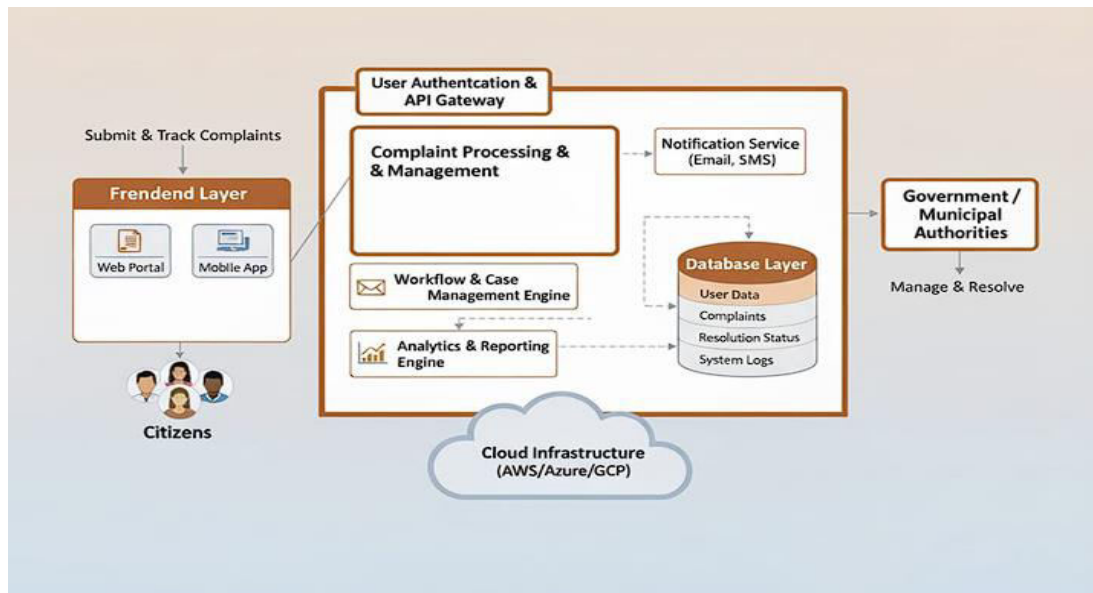


Fig. 1.1 Proposed System Architecture

Data Flow Design

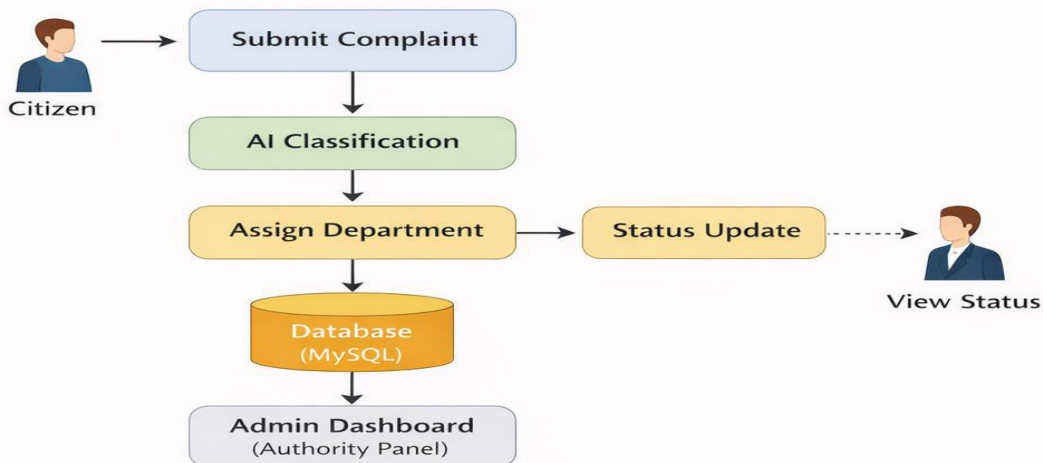


Fig: 1.2 Data Flow Diagram Level 1



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V. CONCLUSION

The Smart Citizen Complaint and Resolution Platform using AI successfully demonstrates how technology can enhance governance, transparency, and citizen engagement in modern urban systems. By integrating Artificial Intelligence (AI) and Natural Language Processing (NLP), the platform automates complaint categorization, prioritization, and routing, reducing manual effort and improving response time. It bridges the communication gap between citizens and municipal authorities by offering real-time complaint tracking, automated notifications, and analytical dashboards for performance monitoring. The system not only simplifies grievance redressal but also empowers citizens to actively participate in improving civic infrastructure. For government bodies, it provides data-driven insights for better decision making and resource management. With its modular design, scalability, and user-friendly interface, the project can be further expanded into a full-fledged smart city application by integrating IoT sensors, chatbots, and multilingual support. In conclusion, this project contributes toward building a smarter, more accountable, and citizen-centric governance ecosystem, aligning with the vision of Digital India and Smart City initiatives.

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