

# **AI-Driven Government Complaint & Case Management System**

## **❖ Problem Statement**

In many cities and towns, citizen complaints related to essential public services such as water supply, roads, electricity, sanitation, streetlights, and drainage are still handled through fragmented channels like phone calls, emails, walk-in counters, or basic portals. Existing grievance systems primarily register complaints and generate a ticket number, but they lack intelligent mechanisms for automatic categorization, prioritization, routing to the right department, SLA-based monitoring, and analytics for governance. As a result, high-impact issues get delayed, complaints are misrouted or manually handled, SLA breaches go unnoticed, and citizens experience low transparency and reduced trust in public institutions.[\[1\]](#)[\[2\]](#)[\[3\]](#)[\[4\]](#)[\[5\]](#)[\[6\]](#)

Recent work on AI-driven grievance systems shows that techniques like NLP-based categorization, urgency prediction, and AI assistants can significantly improve routing accuracy, response times, and citizen engagement. However, many of these solutions focus on automation and do not clearly embed human oversight, multi-layer governance, or community participation. There is a need for a **centralized, AI-assisted, role-based complaint and case management platform** that supports the complete lifecycle from complaint intake to closure, while ensuring transparency, accountability, and human control over final decisions.[\[7\]](#)[\[8\]](#)[\[9\]](#)[\[2\]](#)[\[10\]](#)[\[11\]](#)[\[12\]](#)

This project proposes an **AI-Driven Government Complaint & Case Management System** built using Django and an SQL database, which allows citizens to file complaints digitally, assists officials with AI-based categorization and prioritization, supports SLA tracking and escalation, enables community discussion, and provides monitoring dashboards to authorities—while keeping humans in charge at every decision point.[\[8\]](#)[\[6\]](#)[\[13\]](#)

## **⌚ Objectives of the Project**

- To digitize and standardize the entire government grievance redressal workflow from complaint registration to closure, with proper audit trails and SLAs.[\[3\]](#)[\[6\]](#)
- To assist officials using AI-based complaint categorization, priority prediction, and routing suggestions (not full automation).[\[9\]](#)[\[7\]](#)[\[8\]](#)
- To ensure transparency and accountability through real-time status tracking, escalation logs, and citizen feedback mechanisms.[\[2\]](#)[\[10\]](#)[\[3\]](#)

- To improve citizen engagement using a community discussion space and an AI guidance assistant that explains processes and status.<sup>[10][14][15]</sup>
- To provide data-driven insights (trends, hotspots, SLA reports) that support administrative and policy-level decisions.<sup>[16][11][2]</sup>

## Key Features (Detailed)

### **1 Citizen Complaint Management**

- Online complaint submission:
  - Citizens submit complaints with category, textual description, optional attachment (image/video link), and location (area + optional GPS coordinates).<sup>[17][3]</sup>
  - Forms are mobile-friendly for easy access.
- Complaint lifecycle and tracking:
  - Status flow: New → AI\_Triage\_Suggested → Assigned → In\_Progress → Resolved (and optional Rejected / Closed\_No\_Action).<sup>[6][1]</sup>
  - Citizens can view a detailed timeline: who handled the complaint, when it was updated, and what action was taken.
- Notifications:
  - Email/SMS/in-app notifications when complaint is registered, assigned, updated, escalated, or resolved (can be simulated in prototype).<sup>[14][3]</sup>
- Feedback and rating:
  - After resolution, citizens rate the resolution, add comments, and mark “satisfied / not satisfied”, feeding into analytics and quality metrics.<sup>[18][19]</sup>

### **2 AI-Assisted Decision Support**

*(All AI is assistive; officers can override suggestions.)*

- Automatic complaint categorization:

- NLP model processes complaint text and predicts category (e.g., water, road, power, sanitation, streetlight, drainage, other).<sup>[7][8][9]</sup>
- Priority prediction:
  - Model predicts urgency level (Low / Medium / High) using features like keywords, sentiment, location, and historical patterns.<sup>[11][9][7]</sup>
- SLA breach risk prediction:
  - Based on current backlog, previous delays, and complaint type, the system flags complaints that are likely to breach SLA if not acted on soon.<sup>[9][11][7]</sup>
- Department routing recommendation:
  - Suggests the most appropriate department and possibly sub-unit (e.g., “Water Department → Pipeline Maintenance”) for each complaint.<sup>[20][12][8]</sup>
- Human-in-loop:
  - Officers see AI suggestions (category, priority, department) with confidence scores and can accept, modify, or reject them; changes are logged for model improvement and audit.<sup>[21][2][10]</sup>

## **3 Role-Based Governance & Workflow**

The platform implements a multi-role, multi-layer governance structure.

- **Citizen Layer**
  - File and track complaints, participate in discussions, interact with AI assistant for guidance.<sup>[14][3]</sup>
- **Local Officer Layer**
  - Sees assigned complaints, updates status, adds field notes, attaches action photos, and records actual resolution details.<sup>[1][3]</sup>
  - Can escalate complaints to Department Admin if blocked.
- **Department Admin Layer**
  - Manages all complaints within a specific department (e.g., Water, Roads, Electricity).<sup>[22][3]</sup>
  - Assigns/reassigns complaints to officers, monitors SLA compliance, and handles escalations.

- Moderates community discussions for their department.
- **City / State Authority Layer**
  - Read-only access to aggregated dashboards across all departments: trends, hotspots, SLA statistics, and escalation patterns.[\[23\]](#)[\[2\]](#)[\[10\]](#)
  - Uses insights for policy and planning.
- **System Super Admin Layer**
  - Manages users, roles, departments, configuration (SLA rules, AI thresholds) and system logs.[\[6\]](#)[\[1\]](#)
  - Deploys/updates AI models and monitors system health, but does **not** change complaint outcomes.

Django's authentication, groups, and permissions system will be used to enforce this role-based access control clearly at the view and API level.[\[24\]](#)[\[6\]](#)

## 4 Community Discussion Module

- Public issue threads:
  - Citizens can create discussion threads for broader civic issues (e.g., "Water supply issue in Ward 10", "Garbage collection timing").[\[25\]](#)[\[14\]](#)
- Linking with complaints:
  - Complaints can optionally be linked to relevant discussion threads to reduce duplicates and centralize information.
- Officer participation:
  - Local Officers and Department Admins can respond with clarifications, updates, and official statements visible to all.
- Moderation:
  - Department Admins and System Admin can moderate posts, remove abusive content, and close threads when issues are resolved.

This module increases transparency and provides context beyond individual tickets, similar to civic-tech initiatives that combine grievance redressal with public discourse.[\[10\]](#)[\[14\]](#)

## 5 AI Talking Assistant (Guidance Only)

- Citizen guidance:
  - Conversational assistant helps users choose the right category, explains what information to provide, and clarifies how SLAs and escalation work.[\[26\]](#)[\[2\]](#)[\[7\]](#)
- Status explanation:
  - When a citizen asks “What is happening with my complaint?”, the assistant reads status and timeline from the database and explains it in simple language.[\[27\]](#)[\[7\]](#)
- FAQs:
  - Answers common questions about departments, services, timelines, and escalation rules based on a curated knowledge base.[\[16\]](#)[\[2\]](#)
- No direct actions:
  - The assistant **cannot** close, modify, or reassign complaints; it can only guide or suggest, reinforcing that final actions are human-controlled.[\[2\]](#)[\[21\]](#)[\[10\]](#)

## 6 Analytics & Monitoring Dashboards

- Department-wise statistics:
  - Number of complaints received, resolved, pending, and reopened per category and per time period.[\[3\]](#)[\[6\]](#)
- SLA and escalation reports:
  - SLA compliance percentage, average resolution time, and number of escalated cases by department and area.[\[13\]](#)[\[11\]](#)[\[2\]](#)
- Hotspot and trend analysis:
  - High-complaint areas (wards/localities), recurring issues, seasonal patterns (e.g., drainage complaints in monsoon).[\[11\]](#)[\[16\]](#)[\[2\]](#)
- AI performance metrics:
  - Accuracy of categorization, routing, and priority predictions, plus override statistics (how often humans changed AI suggestions).[\[19\]](#)[\[20\]](#)[\[7\]](#)

These dashboards are built via SQL aggregation queries and visualized in Django views, inspired by modern AI-enabled grievance dashboards.<sup>[16][2][11]</sup>

## System Layers & Technology Stack

- **Frontend:**
  - Django templates / minimal SPA (HTML, CSS, JS) for dashboards and forms.
- **Backend:**
  - Django for REST-style APIs, business logic, role-based workflows.
- **Database (SQL):**
  - PostgreSQL/MySQL for relational schema: Users, Roles, Departments, Complaints, SLA Rules, AI Suggestions, Discussion Threads, Feedback, Audit Logs.<sup>[24][6]</sup>
- **AI/NLP Services:**
  - Python models (could be separate microservice or integrated module) for categorization, priority prediction, and FAQ answering, similar to other AI grievance systems.<sup>[8][7][9]</sup>

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## Why this Project:

Directly aligned with current government and civic-tech trends like AI-powered grievance redressal (CPGRAMS, state-level pilots, AI NCH, IGMS).

- Emphasizes **human-in-loop, ethical AI** and real multi-layer governance logic, which is rare in typical student projects.