International Journal of Web of Multidisciplinary Studies
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
website: https://ijwos.com
Volume 3 Issue 8 , August 2026
E-ISSN : 3049-2424
DOI: https://doi.org/10.71366/ijwos

Civic Issue Reporting System: A Mobile and Web-Based Platform for Citizen–Government Engagement

Roja M[1], Sowmya K H[2], Niveditha G[3], Prof. Krupa Rani S[4]
[1,2,3] MCA 4th Sem GM University, Davangere
[4]Department of MCA, GM University, Davangere, Karnataka, India.

Article Info

Article History:

Published: 31 August 2026

Publication Issue:
Volume 3, Issue 8
August-2026

Page Number:
736-741

Corresponding Author:
Roja M

Abstract:

Local governments across the world face persistent challenges in identifying and resolving everyday civic problems such as potholes, malfunctioning streetlights, overflowing garbage bins, water leakage, and damaged public infrastructure. Traditional grievance-redressal mechanisms — phone calls, physical visits to municipal offices, or paper-based complaint registers — are slow, opaque, and difficult to scale to the size of a modern city. This paper presents the design and conceptual implementation of a Civic Issue Reporting System (CIRS): a mobile and web-based platform that allows citizens to report civic problems in real time using geotagged photographs and short descriptions, and allows municipal staff to triage, assign, track, and resolve those complaints through a centralized administrative dashboard. The proposed system combines a citizen-facing mobile/web application, a rolebased administrative back end, a relational database, and optional machine-learning components for automatic complaint categorization and duplicate detection. We describe the system architecture, database design, technology stack, and development methodology, and discuss the advantages, limitations, and future scope of such systems, including AI-based classification, IoT sensor integration, and multilingual accessibility.

Keywords: civic issue reporting, e-governance, grievance redressal system, smart city, complaint management, citizen engagement, mobile application, geotagging

1. INTRODUCTION

Cities are growing faster than the administrative capacity of the municipal bodies that maintain them. As urban populations expand, the volume of everyday infrastructure problems — potholes, broken streetlights, clogged drains, illegal garbage dumping, damaged public property — grows accordingly. Historically, citizens have reported such issues through phone helplines, in-person visits to ward offices, or letters, all of which suffer from long response times, lack of transparency, and no mechanism for the citizen to track the status of a complaint once it has been filed.

The widespread availability of smartphones, GPSenabled devices, and mobile internet has created an opportunity to digitize this process. A Civic Issue Reporting System (CIRS) allows any citizen to capture a photograph of a problem, tag its exact location using GPS, add a short description, and submit it instantly to the relevant municipal department. The department can then view, categorize, assign, and resolve the complaint through a digital dashboard, while the citizen receives status updates until the issue is closed. This not only speeds up resolution but also creates an auditable record that improves transparency and accountability in local governance.

This paper is organized as follows. Section II reviews related work. Section III states the problem. Section IV outlines the objectives. Section V describes the system architecture. Section VI discusses the development methodology. Section VII presents the database design. Section VIII covers implementation and the technology stack. Section IX discusses results, advantages, and limitations. Section X outlines future scope, and Section XI concludes the paper.

2. LITERATURE REVIEW

A number of studies have examined citizen complaint and civic-issue reporting systems from different technical angles. A recent survey of citizen complaint management systems traces the shift from manual, in-person grievance handling toward digital platforms that use online forms, automated routing, and case tracking, and highlights the growing role of data analytics and multichannel access in improving transparency between governments and citizens [1].

Systems such as Fix-It combine an Android application, an online database, and Google Maps integration to let residents report an incident along with its precise location, forwarding the report directly to the relevant service provider [2]. Similarly, GPS-based complaint redressal systems use device location data to automatically route a complaint to the nearest or most relevant municipal office, reducing manual sorting effort [3].

More recent work has begun to incorporate machine learning to reduce the manual burden on municipal staff. One study trained a deep-learning image classifier on thousands of images of municipal issues to automatically sort complaints by category, while also filtering out fraudulent or duplicate submissions [4]. Other prototypes apply image-processing techniques — such as edge detection and clustering — specifically to detect potholes from citizen-submitted photographs [5]. A related project, CiviCare, proposes an AI-powered end-to-end portal aimed at shortening complaint-to-resolution time and reducing the incidence of false grievances through automated verification [6].

A comparative study of thirteen city governments' nonemergency reporting channels found that citizens are often given many uncoordinated ways to report an issue (phone, email, web form, WebGIS, mobile app), and that channel quality varies widely in searchability, issue coverage, geolocation support, and status visibility — underscoring the need for a single, well-designed, unified platform [7]. Taken together, this body of work motivates a system that unifies geotagged citizen reporting, automated classification, and transparent status tracking within one platform, which is the approach adopted in this paper.

3. LITERATURE SURVEY

Author / Year	System / Study	Main Contribution
Swachhata App	Civic Complaint System	Citizens report issues using photos and location.
Shama et al., 2024	CitySolution	Uses deep learning to classify civic complaints.
Civi-Snap, 2026	Civic Issue Detection	Detects civic issues using images and geotagging.
AI-Based System, 2026	Complaint Management	Automatically classifies and routes complaints.
eGov Foundation	Complaint Resolution System	Provides complaint tracking and status updates.
CPGRAMS	Government Grievance System	Allows online complaint registration and tracking.

Research Gap: Existing systems provide complaint reporting, tracking, or AI-based classification separately. The proposed **Civic Issue Reporting System** combines **mobile and web reporting, image upload, location tracking, automated classification, and status monitoring** in one platform.

4. PROBLEM STATEMENT

Existing grievance-redressal mechanisms in most municipalities suffer from several shortcomings: (1) complaints are recorded manually and are prone to loss or delay; (2) citizens have no way to track the status of a submitted complaint; (3) there is no systematic way to detect duplicate reports of the same issue from multiple citizens; (4) complaints are not automatically routed to the correct department, causing delays; and (5) municipal authorities lack a consolidated,

data-driven view of recurring problem areas across the city. There is therefore a need for a unified digital platform that addresses these gaps end-to-end.

5. OBJECTIVES OF THE PROPOSED SYSTEM

- Enable citizens to report civic issues quickly using photographs, GPS location, and a short text description.
- Provide real-time status tracking (Submitted → Acknowledged → In Progress → Resolved) for every complaint.
- Automatically or manually route complaints to the correct municipal department based on category.
- Detect and merge duplicate complaints reported near the same location.
- Give administrators a dashboard with analytics on complaint volume, category, resolution time, and geographic hotspots.
- Support multilingual input and low-bandwidth / offlinefirst submission for wider accessibility.
- Maintain an auditable history of every complaint for transparency and accountability.

6. SYSTEM ARCHITECTURE

A. Overview

The proposed CIRS follows a three-tier architecture consisting of a presentation layer (citizen mobile/web app and admin web dashboard), an application layer (REST API server containing business logic such as authentication, routing, and notification), and a data layer (relational database plus file/object storage for images). A citizen submits a complaint from the mobile/web client; the API server validates and stores the complaint, geotags it, and optionally classifies it using a machine-learning model; the complaint is then routed to the appropriate department's queue in the admin dashboard, where staff update its status until resolution, with the citizen notified at each step.

B. Core Modules

Table I summarizes the core functional modules of the system.

Module	Function
Module	**Function**
Citizen App	Registration/login, complaint submission with photo + GPS + description, status tracking, notifications.
Admin Dashboard	Department-wise queue, assignment, status updates, analytics, map-based hotspot view.
Complaint Engine	Validation, categorization, duplicate detection, routing rules, SLA/escalation timers.
Notification Svc.	Sends SMS/push/e-mail alerts on status changes.

Classification (opt.)	ML model auto-tags category (pothole, garbage, streetlight, etc.) from photo.
Analytics	Aggregates resolution time, complaints per ward, recurring hotspots.

TABLE I. CORE SYSTEM MODULES

C. Data Flow

1) Citizen captures a photo, the app auto-fetches GPS coordinates, and the citizen adds a short description and selects (or lets the system infer) a category. 2) The client sends this payload over HTTPS to the REST API. 3) The server stores the image in object storage and the metadata in the relational database. 4) The complaint engine checks for duplicates within a configurable radius and time window. 5) The complaint is routed to the responsible department's queue and an acknowledgment is sent to the citizen. 6) Staff update the status as work progresses, triggering citizen notifications. 7) On resolution, the citizen may rate the resolution, closing the feedback loop.

7. DEVELOPMENT METHODOLOGY

The system is best developed using an Agile methodology in short iterative sprints: (1) requirement gathering and use-case definition, (2) UI/UX wireframing, (3) backend API and database design, (4) core module implementation, (5) integration of maps/GPS and notification services, (6) optional ML classification module, (7) unit/integration/user-acceptance testing with a pilot group, and (8) deployment and monitoring.

8. DATABASE DESIGN

A relational schema is well suited to this domain because complaints, users, departments, and status history have clear relationships. The core entities are:

- Users (citizen_id, name, phone, email, password_hash, role)
- Complaints (complaint_id, citizen_id, category_id, description, photo_url, latitude, longitude, status, created_at, department_id)
- Departments (department_id, name, category_scope, contact_info)
- Categories (category_id, name, default_department_id)
- StatusHistory (history_id, complaint_id, status, updated_by, updated_at, remarks)
- Notifications (notification_id, user_id, complaint_id, message, sent_at, channel)

Complaints reference Users, Categories, and Departments through foreign keys, while StatusHistory maintains a full audit trail supporting both citizen-facing tracking and administrative reporting.

9. IMPLEMENTATION AND TECHNOLOGY STACK

A representative technology stack, drawn from common practice in similar civic-tech projects, is summarized in Table II. The client layer can be a cross-platform mobile app (React Native/Flutter) plus a responsive web dashboard; the backend a REST API (Node.js/Express, Django, or Flask); the database PostgreSQL/MySQL with object storage for images; and mapping via Google Maps or

OpenStreetMap/Leaflet.

Layer	Representative Tech.
Citizen app	React Native / Flutter
Admin dashboard	React / Angular + Chart.js
Backend API	Node.js/Express, Django REST, Flask
Database	PostgreSQL / MySQL; Redis cache
File storage	AWS S3 / Firebase Storage
Maps/geo	Google Maps API, Leaflet
Notifications	Firebase Cloud Messaging, Twilio
Classification	CNN via TensorFlow / Teachable Machine
Hosting	AWS / Azure / GCP, Docker

TABLE II. REPRESENTATIVE TECHNOLOGY STACK

10. DISCUSSION: ADVANTAGES AND LIMITATIONS

A. Advantages

- Faster complaint-to-resolution time versus manual/phone-based systems.
- Increased transparency through real-time citizen status tracking.
- Data-driven governance via aggregated complaint analytics.
- Reduced duplicate effort through automatic duplicate detection.
- Higher citizen participation and trust through visible accountability.

B. Limitations

- Digital-divide risk for citizens without smartphones/internet access.
- Risk of false or spam complaints requiring moderation.
- Dependence on accurate GPS, unreliable indoors or in dense areas.
- Requires sustained institutional commitment to keep response times low.

11. FUTURE SCOPE

- AI-based automatic classification and prioritization from photos.
- IoT sensor integration for automated fault detection.
- Predictive analytics to forecast infrastructure failure hotspots.

- Chatbot / voice-based (IVR) reporting for greater accessibility.
- Blockchain-based audit trails for tamper-proof records.
- Integration with existing smart-city command-andcontrol platforms.

12. CONCLUSION

This paper presented the design of a Civic Issue Reporting System that digitizes the end-to-end lifecycle of a municipal complaint — from citizen submission with photo and GPS location, through automated or manual routing, to resolution and feedback. By consolidating fragmented reporting channels into a single transparent platform with real-time tracking and administrative analytics, such a system can meaningfully reduce resolution times, improve accountability, and increase citizen trust in local governance. While challenges such as the digital divide and spam risk must be actively managed, the architecture outlined here provides a practical starting point for students, civic-tech developers, and municipal IT teams. Future enhancements involving AI-based classification, IoT integration, and predictive analytics can further strengthen the platform's impact on smart, responsive urban governance.

References

[1] "A Technological Survey on Citizen Complaint Management Systems and Future Advances," IEEE Conference Publication, IEEE Xplore, 2024.

[2] "Fix-It: Design and Implementation of a Public Complaint Management System," IEEE Conference Publication, IEEE Xplore, 2023.

[3] V. K. Kandhari and K. D. Mohinani, "GPS Based Complaint

Redressal System," in Proc. 2014 IEEE Global Humanitarian Technology Conference – South Asia Satellite (GHTC-SAS), 2014.

[4] "Deep Learning-Based Complaining Task Distribution towards Smart City," IEEE Conference Publication, IEEE Xplore, 2024.

[5] "Public Complaint Sorting for Smart City using Image Processing," Int. J. Adv. Research in Computer and Communication Engineering (IJARCCE), 2021.

[6] M. C. Dafale et al., "CiviCare: AI-Powered Platform for Citizen Complaints & Public Infrastructure Maintenance," ResearchGate preprint, 2022.

[7] "Citizen Reporting as the Form of E-Participation in Smart Cities," IEEE Conference Publication, IEEE Xplore, 2019.

[8] D. Walwadkar and S. Yadav, "Smart Civic Issue Reporting

System," Int. J. Adv. Research in Science, Communication and Technology (IJARSCT), DOI:10.48175/IJARSCT-2659.

[9] "CivicFix: Smart Complaint Routing for Urban Solutions," Int.

J. Adv. Research in Computer and Communication Engineering (IJARCCE), 2025.

[10] "Smart City Complaint Analyzer," Int. Research J. of Modernization in Engineering, Technology and Science (IRJMETS).