

## Crowdsourced Civic Issues Reporting and Resolution System

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### Abstract

*In many cities and towns, people regularly face common civic problems such as potholes on roads, garbage overflow, water leakage, broken streetlights, and drainage issues. These problems often remain unresolved for a long time because the existing complaint systems are slow, manual, and not well organized. Citizens usually have to report issues through helplines, emails, or local offices, but these methods lack proper tracking and transparency. As a result, complaints may get delayed, ignored, or lost, which creates frustration among people and reduces their trust in municipal services. To solve these problems, this project introduces a Crowdsourced Civic Issue Reporting and Resolution System. It is a simple App-based platform where citizens can easily report civic issues using images, descriptions, and live location. All complaints are stored in a centralized system and automatically forwarded to the concerned municipal departments for action. Authorities can manage these complaints through an admin dashboard, update their status as Pending, In Progress, or Resolved, and provide updates to citizens. This system makes the entire process digital, faster, and more transparent. It improves communication between citizens and authorities and ensures better accountability. By encouraging public participation in civic management, the system supports Smart City and Digital India initiatives. Overall, it helps create cleaner, safer, and more efficiently managed urban environments.*

**Keywords:** Civic issues, e-governance, public participation, smart city, complaint system, transparency, issue reporting.

### 1. Introduction

In recent years, cities have been growing rapidly due to urbanization and population growth. While this development brings better opportunities and infrastructure, it also increases everyday civic problems faced by citizens. Issues such as poor waste management, potholes on roads, broken streetlights, irregular water supply, and drainage problems have become very common in both urban and semi-urban areas. Although each of these issues may seem small individually, together they significantly affect the quality of life of people and sometimes even create safety risks. At present, most civic complaint systems depend on traditional and manual methods. Citizens usually need to visit municipal offices, make phone calls, or send emails to report their problems. These methods are slow, inconvenient, and not user-friendly. More importantly, they do not provide proper updates to citizens after the complaint is registered. As a result, people often do not know

whether their issue is being addressed, delayed, or ignored. This lack of transparency reduces trust between citizens and local authorities. To overcome these limitations, there is a strong need for a simple and digital system that can improve communication between citizens and government authorities. The proposed system, Crowdsourced Civic Issue Reporting and Resolution System, is designed to solve this problem in an efficient and user-friendly way. It allows citizens to report civic issues instantly using their mobile phones or computers. In this system, users can submit complaints along with photos, location details, and short descriptions of the issue. This helps authorities understand the problem clearly and take quick action. The system also checks for duplicate complaints to maintain accuracy and avoid unnecessary repetition. Once a complaint is submitted, it is forwarded to the concerned municipal department. Municipal staff can access all complaints

through a centralized dashboard that includes a map-based interface. From here, they can view, prioritize, and update the status of each issue as Pending, In Progress, or Resolved. This ensures proper tracking and organized workflow. Citizens are also kept informed throughout the process. They receive real-time updates about their complaints and can track progress anytime. This feature improves transparency and builds trust between the public and authorities. To make the system more user-friendly and accessible for citizens from rural and semi-urban areas, the application provides bilingual support in English and Marathi. Many citizens are more comfortable using their native language while reporting civic issues. Therefore, the system allows users to switch between English and Marathi at any time. Overall, this digital platform helps in improving civic management by making the system faster, more transparent, and more accountable. It encourages public participation and supports the vision of smarter and more sustainable urban development.

### 1.1. System Architecture and Workflow

The proposed Crowdsourced Civic Issue Reporting and Resolution System is designed using a layered architecture. This structure helps the system run smoothly, remains easy to maintain, and allows different parts of the application to work together efficiently. The main layers of the system include the Frontend Layer, Backend Layer, Data Layer, and External APIs.

## 2. System Architecture

The system architecture is designed in a way that each layer has a specific responsibility, ensuring clear separation of tasks and better performance[1].

### 2.1. Frontend Layer (Flutter App):

This is the part of the system that users interact with directly. It is developed using Flutter and includes both citizen and admin interfaces. Citizens use this app to report civic issues, while administrators use it to manage and monitor complaints. The interface is kept simple so that anyone can easily use it without technical knowledge. To improve accessibility and usability, the system includes bilingual support in both English and Marathi using Flutter Localization, enabling users to switch languages dynamically throughout the application[2].

### 2.2. Backend Layer (Flask API Server):

The backend acts as the brain of the system. It is built using Flask and handles all the main operations such as user authentication, complaint processing, and data communication between frontend and database. It includes services like:

- API Gateway for managing requests
- Complaint Service for creating, reading, updating, and deleting complaints [3]

### 2.3. Data Layer:

This layer is responsible for storing all the information. The system uses:

- Supabase: for storing complaint details, user data, and system records[4]
- SQLite: for local storage, mainly used for authentication purposes when needed
- This ensures that data is stored safely and can be accessed quickly whenever required[5].

### 2.4. External APIs:

The system also integrates external services to improve functionality:

- Google Maps API is used to capture and display the exact location of civic issues
- AI/ML APIs are planned for future upgrades to automate complaint classification and improve efficiency[6]

This architecture makes the system scalable, transparent, efficient, and user-friendly while supporting inclusive digital governance for both urban and rural citizens. Shown as Figure 1 System Architecture[7]

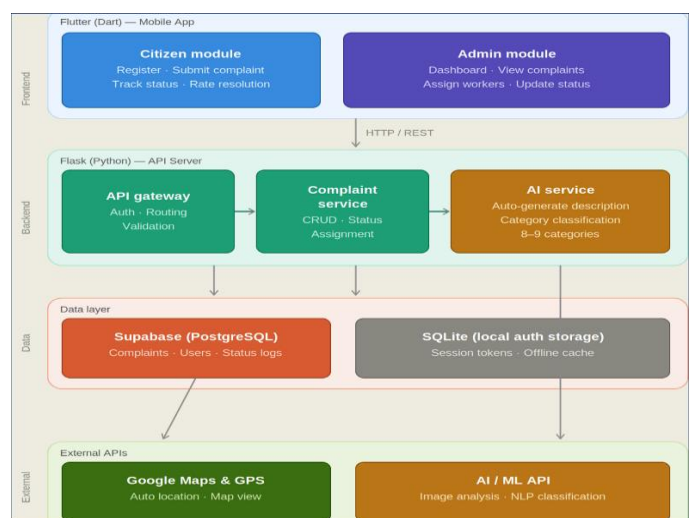


Figure 1 System Architecture

## 2.5. Workflow of the System

The working process of the system follows a clear step-by-step flow to ensure that every complaint is properly recorded, handled, and resolved[8].

### Step 1: Citizen Login

The process begins when a citizen logs into the application using their valid credentials. If the user is new, they can first register and then log in.

### Step 2: Complaint Submission

The citizen reports an issue by filling in a simple form. They can:

- Select the category of the problem (such as garbage, road damage, water leakage, etc.)
- Write a short description of the issue
- Upload a photo for better understanding
- Share live GPS location so the exact place of the issue is recorded [9]

### Common issue categories include:

garbage problems, damaged roads, broken streetlights, water leakage, drainage blockages, and public sanitation issues.

### Step 3: Complaint Storage

Once submitted, the complaint is stored in the database along with all its details. At this stage, the status of the complaint is marked as Pending, meaning it is waiting for review.

### Step 4: Admin Review

The admin (or Gram Sevak) logs into the dashboard and checks all reported complaints. They can view complaints in different ways such as: List view, Map-based view, Search and filter options

The admin carefully checks each complaint and decides how urgent it is.

### Step 5: Worker Assignment[11]

After reviewing, the admin assigns the complaint to the appropriate worker or department responsible for handling that specific issue.

### Step 6: Issue Resolution

The assigned worker visits the location, fixes the problem, and uploads proof such as an after-work photo. Once the task is completed, the worker marks it as done in the system, As shown in Figure 4 Complaint Details[12]

### Step 7: Admin Verification

The admin verifies the completed work to ensure the issue has been properly resolved. After verification,

the complaint status is updated to Resolved.

### Step 8: Citizen Tracking

Citizens can track the entire progress of their complaint in real time. The status changes from: Pending → In Progress → Resolved[10]

## 3. Results And Discussion

### 3.1. Results

The proposed Crowdsourced Civic Issue Reporting and Resolution System was implemented and tested to evaluate its real-world performance in handling civic problems such as garbage issues, road damage, broken streetlights, and water leakage. During testing, the system worked successfully in allowing citizens to report issues easily through a simple interface. Users were able to submit complaints with a description, image, and live location. This helped ensure that every complaint was clear and accurate for authorities to understand and act upon. All complaints were stored in the database with a unique ID and initially marked as Pending. The system ensured that no complaint was missed or lost. The admin panel allowed municipal staff to view, filter, and manage complaints efficiently using both list view and map view. The workflow functioned properly, where complaints were assigned to workers and updated step-by-step as: Pending → In Progress → Resolved. Workers updated the system after completing tasks by uploading proof images, and the admin verified before marking the complaint as resolved. Shown in Figure 1 Home Page, Figure 2 Worker Page, Figure 3 Officer Dashboard



Figure 1 Home Page

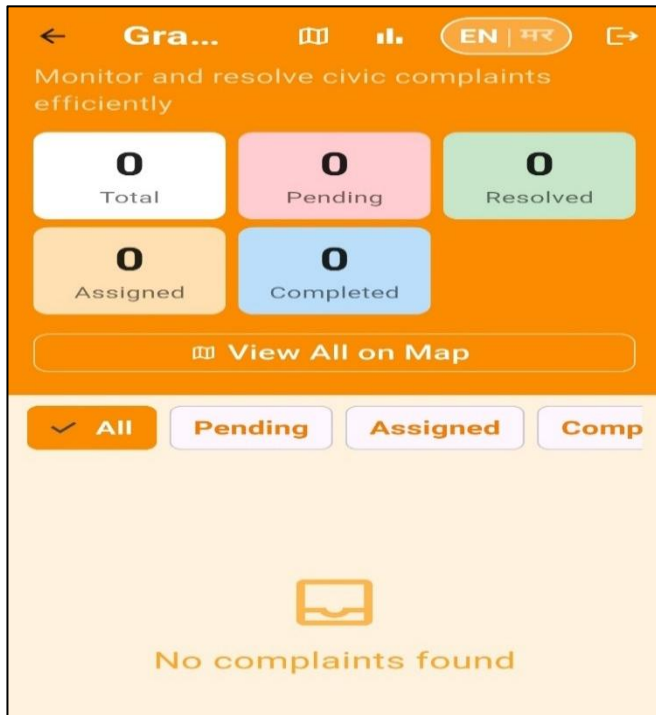


Figure 2 Worker Page

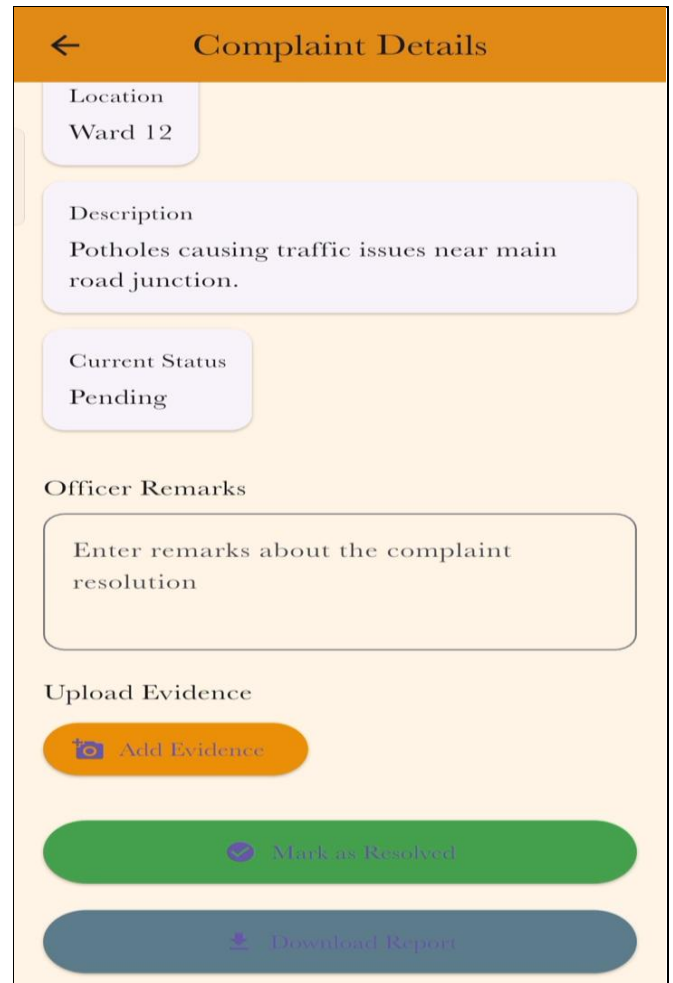


Figure 4 Complaint Details

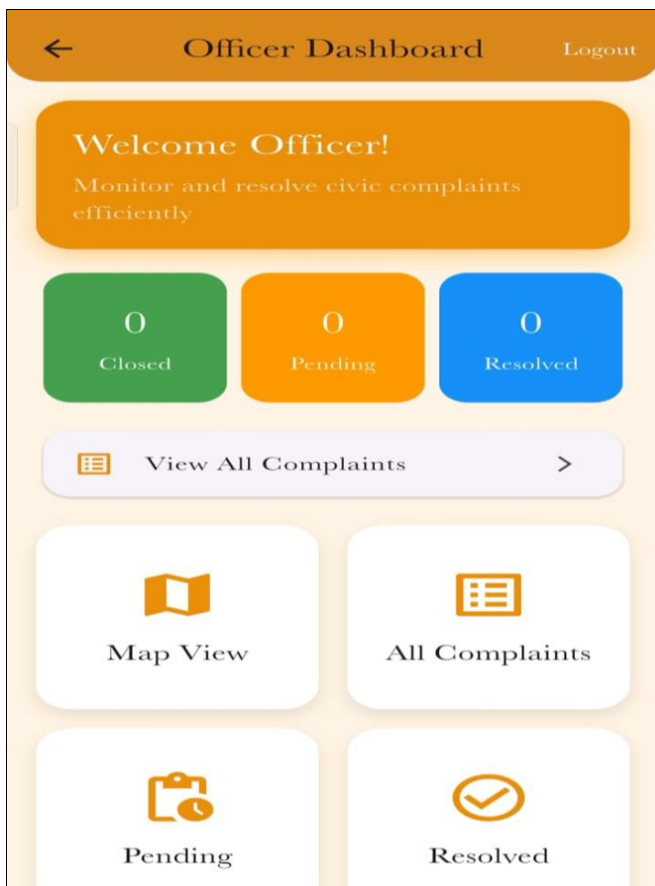


Figure 3 Officer Dashboard

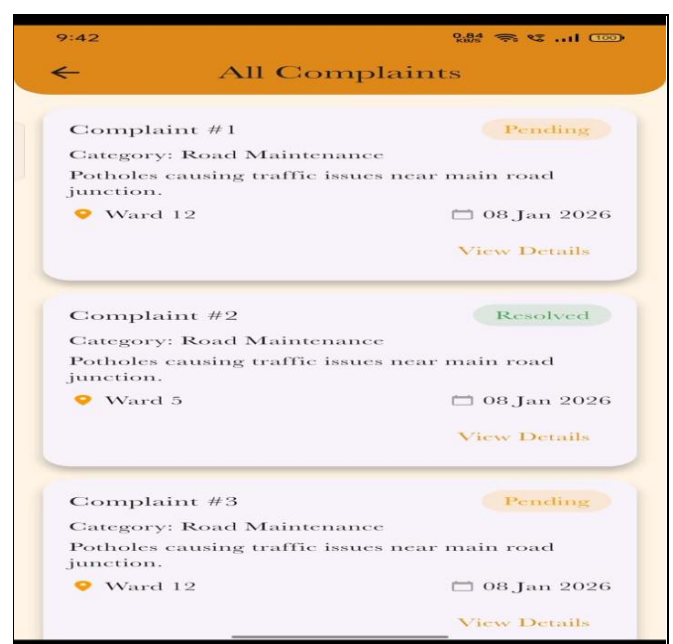
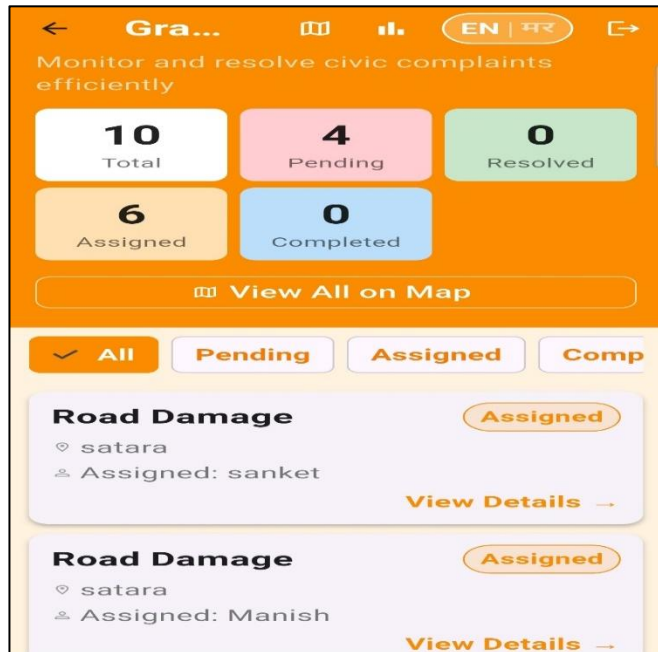


Figure 5 All Complaints



**Figure 6 Worker Dashboard**

### 3.2.Discussion

The results clearly show that the system improves the way civic issues are reported and resolved. Traditional systems are slow and lack proper updates, but this system solves these problems through digital automation. One major improvement is ease of use. Citizens can report issues quickly without visiting offices or making calls. Adding images and GPS location improves accuracy and helps authorities respond faster[13]. Another key improvement is transparency. Citizens can track complaint status in real time, which builds trust and reduces confusion. The system also improves efficiency by organizing complaints in a structured dashboard and assigning them properly to workers. The workflow ensures that every complaint follows a proper process and is not ignored. This increases accountability among municipal staff and improves response time. However, the system requires internet access and needs regular maintenance. In the future, features like offline reporting and AI-based automatic issue detection can further improve performance. Overall, the system provides a simple, effective, and transparent solution for modern civic problem management and supports the idea of smarter urban governance. As shown in Figure 5 All Complains, Figure 6 Worker Dashboard[14].

### Conclusion

The Crowdsourced Civic Issue Reporting and Resolution System provides a simple and effective solution to improve communication between citizens and municipal authorities. It replaces traditional slow and manual complaint methods with a fast, digital platform where users can easily report civic issues using images, descriptions, and live location. The system ensures that every complaint is properly tracked from Pending to In Progress to Resolved, giving citizens real-time updates and improving transparency. It also helps authorities manage, assign, and resolve complaints in an organized way, which increases efficiency and reduces delays. Overall, the system makes civic issue management more transparent, faster, and more reliable, contributing to better and smarter urban governance.

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