

Smart Citizen Complaint Management System: A Mobile-Based E-Governance Approach

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ABSTRACT

The increasing demand for efficient public service delivery has highlighted the limitations of traditional, manual complaint redressal systems. This paper presents a Smart Citizen Complaint Management System (SCCMS), a mobile-based e-governance solution that enables citizens to register complaints digitally, track their status, and receive updates in real time. The system supports automatic complaint routing, departmental handling, and administrative monitoring through reports and analytics. Designed in accordance with IEEE documentation practices and ISO/IEC quality and security standards, the proposed system aims to enhance transparency, accountability, and efficiency in public service management.

Keywords: E-Governance, Complaint Management System, Mobile Application, Smart City, ISO/IEC Standards, IEEE

1. INTRODUCTION

Good governance relies heavily on transparency, accountability, and active citizen participation. With rapid urbanization and population growth, municipal authorities face increasing pressure to provide timely and effective public services. Traditional complaint handling mechanisms, which often depend on physical visits, paper-based forms, or phone calls, are inefficient and lack systematic tracking.

The advancement of mobile technologies and widespread smartphone adoption have created new opportunities for digital governance. Mobile-based applications allow governments to interact directly with citizens, reduce administrative overhead, and ensure faster grievance redressal. A centralized complaint management system can serve as a bridge between citizens and government departments by offering a single platform for complaint registration, monitoring, and resolution.

Another major challenge in existing systems is the lack of transparency and accountability. Citizens are often unaware of the progress made on their complaints, while administrators struggle to monitor departmental performance. Digital complaint management systems address these issues by providing real-time status updates, automated workflows, and data-driven insights.

Furthermore, the integration of emerging technologies such as Artificial Intelligence, geo-location services, and data analytics can significantly improve the effectiveness of grievance handling. These technologies support accurate complaint categorization, location-based analysis, and proactive governance.

In this context, the Smart Citizen Complaint Management System proposed in this paper aims to modernize the public grievance redressal process. The system focuses on improving service delivery efficiency, strengthening administrative control, enhancing citizen trust, and supporting the broader vision of smart cities and digital India.

2. PROBLEM STATEMENT

2.1 Lack of Unified Platform

Existing complaint redressal mechanisms often do not provide a single, unified digital platform where citizens can register and track complaints, resulting in fragmented records and poor coordination.

2.2 manual complaint forwarding

In many traditional systems, complaints are forwarded manually between offices and departments, which leads to unnecessary delays and loss of information.

2.3 limited transparency

Citizens are usually unable to view real-time updates regarding the status of their complaints, which reduces transparency and trust in the system.

2.4 accountability issues

Due to the absence of systematic tracking, it becomes difficult to fix responsibility on concerned officers, leading to inefficiency in complaint resolution.

2.5 Reporting and Analysis Challenges

Manual systems make it difficult to generate analytical reports that support monitoring, evaluation, and data-driven decision-making. These challenges highlight the need for a smart, automated, and transparent complaint management solution.

3. OBJECTIVES OF THE PROPOSED SYSTEM

3.1 primary objective

The primary objective of the proposed Smart Citizen Complaint Management System is to provide a unified, mobile-based platform that enables citizens to register complaints digitally and track their resolution status in a transparent and efficient manner.

3.2 Automation of Complaint Handling

Another important objective is to automate the routing of complaints to the appropriate government departments based on complaint category and location, thereby reducing manual intervention and delays.

3.3 departmental accountability

The system aims to improve accountability by allowing authorized officers to update complaint progress in real time, ensuring responsibility at every stage of resolution.

3.4 administrative monitoring

An additional objective is to assist administrators in monitoring overall system performance through analytical reports related to pending, in-progress, and resolved complaints.

3.5 citizen satisfaction

Finally, the system seeks to enhance citizen satisfaction by providing timely updates, transparency, and feedback mechanisms.

4. SYSTEM OVERVIEW

4.1 citizen module

The Citizen Module enables registered users to securely log in to the mobile application and submit complaints related to public services. Citizens can attach photographs, provide a textual description of the issue, and share GPS-based location data to ensure accurate identification of the problem. For example, a citizen can report a pothole on a road by uploading a photo and automatically sharing the location through GPS, which helps the concerned department identify the exact spot. The module also allows users to track the real-time status of their complaints, such as Submitted, In Progress, or Resolved, and submit feedback after resolution.

4.2 department/officer module

The Department or Officer Module is designed for authorized government officials. Officers can log in using department-specific credentials to view complaints assigned to their department. For instance, a municipal engineer can view all road-related complaints within a specific ward. Officers can update the complaint status, add remarks explaining the action taken, upload resolution evidence such as repaired road images, and communicate with citizens through in-app messaging features.

4.3 admin module

The Admin Module provides complete system control to administrators. Administrators can manage departments and users, monitor all complaints across the system, and generate analytical reports. For example, an administrator can generate a monthly report showing the number of complaints resolved by each department and identify departments with higher pending complaints or delayed response times.

5. PROPOSED ENHANCEMENTS AND INNOVATIVE FEATURES

5.1 ai-based complaint categorization

Artificial Intelligence techniques can be applied to analyze complaint descriptions and images to automatically categorize complaints. For example, if a citizen uploads an image of overflowing garbage and mentions waste collection in the description, the system can automatically assign the complaint to the sanitation department, reducing manual classification errors and speeding up complaint assignment.

5.2 Priority and SLA Management

The system can incorporate priority levels such as low, medium, high, and emergency. For instance, a complaint regarding a broken streetlight may be assigned medium priority, whereas a complaint related to a fallen electric pole can be marked as emergency with a shorter Service Level Agreement (SLA) to ensure immediate action.

5.3 Geo-Analytics and Heat Maps

By utilizing GPS-based location data, the system can generate geo-analytical reports and heat maps that highlight areas with frequent complaints. For example, if a particular locality consistently reports water supply issues, the heat map will visually indicate the area as a high-complaint zone, helping authorities plan long-term infrastructure improvements.

5.4 multilingual support

To improve accessibility, the system can support multiple regional languages, allowing citizens from diverse linguistic backgrounds to use the application effectively.

5.5 Push Notifications and Alerts

Push notifications can be used to inform citizens and officers about complaint registration, status updates, and approaching deadlines, ensuring continuous communication.

5.6 smart city integration

The system can be integrated with smart city infrastructure such as IoT sensors and surveillance systems to enable faster verification and proactive governance.

6. SYSTEM ARCHITECTURE

6.1 frontend layer

The frontend of the proposed system consists of an Android and iOS based mobile application that provides an intuitive user interface for citizens, officers, and administrators.

6.2 backend services

The backend is implemented using RESTful web services that handle business logic, complaint routing, authentication, and communication between system components.

6.3 database layer

A centralized, cloud-based database is used to store user details, complaint records, status updates, images, and location data in a structured manner.

6.4 security layer

The security layer ensures secure access through authentication, role-based authorization, and encryption techniques, thereby protecting sensitive user and complaint data. This layered architecture ensures scalability, reliability, and high availability.

7. STANDARDS AND COMPLIANCE

7.1 ieee standards

The documentation and software development life cycle of the proposed system follows IEEE standards. IEEE 830/29148 is used for preparing a clear and complete Software Requirements Specification. IEEE 1016 supports structured software design documentation, while IEEE 1028 provides guidelines for conducting systematic software reviews to ensure quality.

7.2 iso/iec standards

The system design is aligned with key ISO/IEC standards. ISO/IEC 25010 is applied to ensure software quality attributes such as usability, reliability, and security. ISO/IEC 27001 guides information security management practices, while ISO/IEC 12207 defines standardized software life cycle processes, ensuring quality, security, and maintainability.

8. ADVANTAGES OF THE PROPOSED SYSTEM

8.1 Transparency and Accountability

The proposed system ensures transparency by allowing citizens to track complaint progress while holding departments accountable for timely resolution.

8.2 operational efficiency

Automation reduces paperwork and manual effort, leading to faster processing and resolution of complaints.

8.3 data-driven decision making

Analytical reports generated by the system help authorities make informed decisions based on real-time data.

8.4 improved citizen trust

Consistent updates and visible actions help build trust between citizens and government authorities.

9. LIMITATIONS

9.1 internet dependency

The system requires stable internet connectivity, which may limit accessibility in remote or underdeveloped areas.

9.2 initial implementation cost

Development, deployment, and training costs may be high during the initial phase of implementation.

9.3 adoption challenges

Resistance to change from traditional manual systems may affect early adoption.

10. FUTURE SCOPE

10.1 blockchain integration

Blockchain technology can be used to create tamper-proof complaint records, enhancing trust and transparency.

10.2 voice-based complaints

Voice-enabled complaint registration can improve accessibility for elderly and less literate users.

10.3 predictive analytics

Advanced analytics can be applied to predict recurring issues and support preventive governance.

10.4 national portal integration

The system can be integrated with national-level e-governance portals for broader reach and unified governance.

11. CONCLUSION

The Smart Citizen Complaint Management System provides a robust, transparent, and efficient solution for handling public grievances using mobile technology. By integrating modern features such as AI, geo-location, and analytics, and by adhering to IEEE and ISO/IEC standards, the system can significantly improve public service delivery and citizen satisfaction. The proposed solution supports the vision of smart cities and digital governance.

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