

Smart Public Grievance Management System

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Abstract—Public grievance management requires an efficient mechanism for citizens to report civic issues and for responsible authorities to process, track, and resolve them. Conventional grievance systems may involve manual categorization, departmental routing, limited progress visibility, and insufficient geographical information. This paper presents the Smart Public Grievance Management System (SPGMS), an integrated web-based platform developed to organize the complete grievance management process. The system provides role-based functionality for citizens, officers, and administrators within a unified platform. Citizens can submit grievances by providing issue descriptions and selecting the geographical location of the reported problem. The system incorporates AI-assisted processing to support grievance organization and departmental routing, while map-based functionality records geographical coordinates and enables authorized users to locate reported complaints. Officers can access assigned grievances and update their progress, while administrators can monitor and manage grievance records. The proposed system integrates complaint submission, automated assistance, geographical information, status tracking, and administrative monitoring into a single workflow. The development of SPGMS is informed by previous research in civic complaint categorization, automated grievance management, intelligent complaint routing, citizen-government interaction, and geolocation supported grievance systems [1]-[10]. The system provides a structured technological approach for managing public grievances and establishing a transparent connection between citizens and responsible departments.

Index Terms—Public Grievance Management, E-Governance, Complaint Management System, Artificial Intelligence, Complaint Classification, Complaint Routing, Geolocation, Citizen-Government Interaction, Web-Based System, Grievance Tracking.

I. INTRODUCTION

Public grievance management is an important part of effective interaction between citizens and government

authorities. Citizens regularly report issues such as damaged roads, drainage and sewage problems, waste accumulation, malfunctioning streetlights, and other public-service concerns.

Traditional methods of handling such complaints can involve manual registration, classification, departmental forwarding, and follow-up, which may make the overall process difficult to monitor and can limit visibility into the progress of individual complaints. Recent research has explored digital platforms and intelligent approaches for improving complaint registration, categorization, routing, and citizen-government interaction [1]– [7].

The increasing use of artificial intelligence and web-based technologies provides opportunities to improve the organization and processing of public grievances. Automated complaint categorization can assist in identifying the nature of a reported issue, while intelligent routing can help direct complaints toward the department responsible for handling them [2], [4], [5]. AI-supported citizen assistance has also been investigated as a means of improving interaction between users and public-service systems [6]. These developments indicate the potential for combining automated processing with conventional grievance-management workflows.

Another important aspect of public grievance management is the geographical location of a reported issue. A textual description alone may not always provide sufficient information to identify the exact location of a problem. Previous work has therefore investigated grievance systems incorporating geolocation and other supporting information for public-issue reporting [7], [9]. Providing geographical coordinates along with a complaint can give responsible officers additional information when locating and addressing the reported issue.

To address these requirements, this paper presents the Smart Public Grievance Management System

(SPGMS), an integrated web-based platform for managing public grievances through a unified workflow. The system provides role-based functionality for citizens, officers, and administrators. Citizens can submit grievances, provide descriptions, and select the exact geographical location of an issue. The system uses AI-assisted processing to support the organization and routing of complaints, while officers can access assigned grievances, view complaint information, locate reported issues on a map, and update their progress. Administrators can monitor and manage grievance records within the same platform. Unlike a system focused only on complaint registration, SPGMS combines grievance submission, AI-assisted processing, departmental routing, geographical location, status tracking, and administrative monitoring into one integrated system. The objective is to provide a structured digital workflow that connects citizens with the appropriate departments while maintaining relevant complaint information throughout its lifecycle. The system is developed with consideration of existing research in smart governance, civic complaint categorization, automated grievance management, complaint routing, and geolocation-supported public grievance systems [1]–[10].

The remainder of this paper presents the related work, proposed system architecture, methodology, implementation, experimental setup and evaluation metrics, results and discussion, and conclusion.

II. LITERATURE REVIEW

Recent studies have investigated the use of digital platforms, artificial intelligence, and automated processing for improving public grievance management. Kapoor *et al.* [1] examined smart governance platforms for improving accountability in public-sector services. Tripathi *et al.* [2] proposed CivicComp, focusing on automated categorization of civic complaints using a Hindi-English corpus. Priya *et al.* [3] investigated online complaint registration and management, demonstrating the role of web-based systems in digitizing grievance handling.

AI-based approaches have also been explored for automating grievance processing. Snowfa *et al.* [4] studied intelligent complaint routing using multimodal artificial intelligence, while Sidharth *et al.* [5] investigated automated grievance registration using

transfer learning. Gupta *et al.* [6] presented Gov-Assist, which explored the use of AI for supporting users in public-service environments. These studies demonstrate the potential of intelligent processing to reduce manual effort and improve the organization of complaints.

Citizen participation and location-based reporting are other important areas of grievance management. Mande *et al.* [7] developed CivicConnect to support citizen-government interaction for reporting and resolving public issues. Abirami *et al.* [8] investigated a voice-enabled complaint management system, demonstrating an alternative approach to complaint registration. Javali *et al.* [9] proposed a webbased grievance redressal system incorporating image and geolocation support, highlighting the importance of location information when reporting public issues. Salunkhe *et al.* [10] further explored AI-driven approaches for managing city grievances.

The reviewed studies indicate that complaint categorization, automated routing, citizen interaction, and geographical information can contribute to more structured grievance management. However, these capabilities are addressed individually across the reviewed works. SPGMS integrates these relevant functions into a single platform, combining complaint submission, AI-assisted processing, departmental routing, location selection, status tracking, and role-based management for citizens, officers, and administrators. This forms the basis for the proposed system and its evaluation.

III. METHODOLOGY

The methodology of the Smart Public Grievance Management System (SPGMS) is designed to provide a structured workflow for registering, processing, routing, tracking, and resolving public grievances through a unified web-based platform. The system integrates role-based access, AI-assisted complaint processing, geographical location, and administrative monitoring.

A. Complaint Submission

The process begins when a citizen submits a grievance through the public interface. The citizen provides the required complaint details, including a description of the issue and its geographical location. The location can be selected using the map by searching for a place,

using the available location option, or selecting the exact position through the map marker. The system records the corresponding latitude and longitude along with the grievance.

B. AI-Assisted Complaint Processing

After submission, the grievance is processed by the AI-assisted module. The complaint description is analyzed to identify the type or category of the reported issue. Based on the processed information, the system assists in determining the appropriate department responsible for handling the grievance. This reduces the dependency on completely manual classification and routing.

C. Departmental Routing

Once the complaint is processed, it is routed to the relevant department and made available to the responsible officer. The routing process ensures that complaints such as road damage, drainage or sewage problems, waste-related issues, and streetlight problems are directed according to their identified category.

D. Officer-Side Grievance Handling

Officers can access grievances assigned to their department through the officer interface. They can view the complaint description, submitted information, and geographical location. The map functionality allows officers to locate the exact position associated with a grievance. Officers can also update the progress of the complaint as it moves through the resolution process.

E. Administrative Monitoring

The administrator provides overall monitoring and management of the grievance system. Administrators can review grievance records, monitor their status, and make necessary corrections or management changes when required. This provides an additional level of supervision while allowing the main grievance workflow to operate systematically.

F. Grievance Lifecycle

The complete methodology follows a sequential workflow:

Citizen Submission → Location Selection → AI-Assisted Processing → Departmental Routing → Officer Handling → Status Update → Resolution → Administrative Monitoring

This methodology combines the major functions of complaint management into a single workflow rather than treating complaint registration, routing, geographical information, and monitoring as separate systems. The approach is based on the requirements identified from existing research on automated complaint categorization, intelligent routing, citizen-government platforms, and geolocation-supported grievance management [1]– [10].

The sequential workflow also provides continuity across the different stages of grievance handling. Once a complaint is submitted, the associated description, supporting images, and location information remain connected to the same complaint record throughout its processing. The analysis stage assists in identifying the relevant department and priority, while the routing stage connects the complaint with the appropriate officer. Subsequent status changes and resolution details are recorded to maintain a traceable history of the complaint.

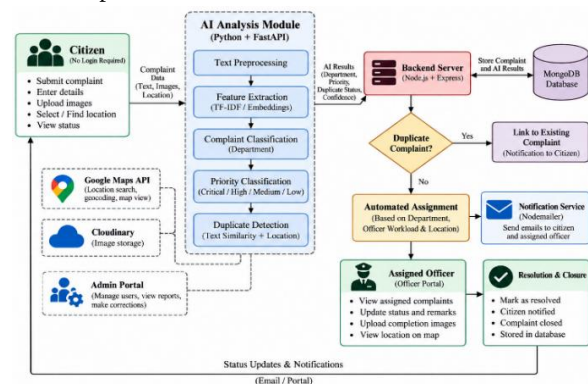


Fig. 1. Overall workflow of the Smart Public Grievance Management System (SPGMS).

IV. IMPLEMENTATION AND SYSTEM ENGINEERING

The Smart Public Grievance Management System (SPGMS) is implemented as an integrated web-based platform for managing the complete grievance lifecycle.

The system combines complaint registration, AI-assisted processing, departmental routing, geographical information, status tracking, and administrative monitoring. This integrated approach is motivated by previous studies on digital grievance platforms, automated complaint management, intelligent routing, and citizen-government interaction [1], [3], [4], [7].

A. System Architecture

SPGMS follows a role-based system architecture consisting of the citizen interface, application processing layer, and administrative and officer interfaces. The citizen interface is used for grievance submission and tracking, while the application layer processes complaint information and supports classification and routing. The officer and administrator interfaces provide facilities for complaint handling, monitoring, and management. The architecture combines functions that have been explored separately in previous grievance-management systems [1], [3], [7].

B. Citizen Interface

The citizen interface allows users to submit public grievances by providing a description of the reported issue and its geographical location. Location information is captured through the integrated map, allowing the user to search for a location or select the exact position of the complaint. The use of geographical information in grievance reporting is consistent with approaches investigated in previous web-based grievance systems [9]. After submission, the complaint is stored and made available for further processing and status tracking.

C. AI-Assisted Processing

The submitted grievance is processed using the system's AI-assisted module. The module analyzes the complaint information to support complaint classification and departmental routing. Automated categorization of civic complaints and intelligent complaint routing have been investigated in previous studies [2], [4], while transfer-learning approaches have also been explored for automated grievance registration [5]. In SPGMS, these concepts are incorporated into the grievance workflow to reduce repetitive manual processing and assist in directing complaints to the appropriate department.

D. Officer Interface

The officer interface provides access to grievances assigned to the corresponding department. Officers can view complaint details, geographical information, and the current status of each grievance. The location component enables officers to identify the reported complaint position on a map. The officer can then update the grievance status as the complaint

progresses toward resolution. This supports the structured complaint-handling and resolution process described in previous public grievance platforms [3], [7].

E. Administrator Interface

The administrator interface provides centralized monitoring and management of grievance records. Administrators can review submitted complaints, monitor their progress, and make necessary corrections when required. This administrative layer supports the accountability and monitoring requirements associated with digital public-service platforms [1].

F. Location and Map Integration

Geographical information is an important component of SPGMS. Citizens can search for a location, use the available location functionality, or select the exact complaint position using the map. The corresponding latitude and longitude are stored with the grievance. Officers and administrators can subsequently access this information to identify the reported location. The incorporation of image and geolocation information in public grievance systems has also been explored in previous research [9].

G. System Engineering

The system is engineered as a single integrated platform rather than as independent applications. Role-based functionality determines the operations available to citizens, officers, and administrators. The application components communicate through the backend services to process grievance information, maintain records, perform AI-assisted processing, assign complaints, and update statuses.

The overall implementation establishes a continuous workflow:

Complaint Submission → Location Capture → AI-Assisted Processing → Departmental Routing → Officer Handling → Status Update → Resolution → Administrative Monitoring

This integration combines the major capabilities identified in existing research, including smart governance [1], complaint categorization [2], online complaint management [3], intelligent routing [4], AI-assisted grievance processing [5], citizen-government interaction [7], and geolocation-supported grievance reporting [9].

V. RESULTS AND DISCUSSION

A. Results

The implementation of the Smart Public Grievance Management System (SPGMS) demonstrates that the proposed platform can support the major stages of the public grievance management process through a unified web-based system. The system allows citizens to submit grievances with relevant descriptions and geographical information, after which the submitted information is processed and routed to the appropriate department.

The integration of AI-assisted processing provides support for organizing complaints and identifying the appropriate department. This addresses the type of automated categorization and routing explored in previous studies [2], [4], [5].

The location component successfully associates a grievance with geographical information. Citizens can select the reported location on the map, while officers and administrators can access the stored location when reviewing a complaint. This is consistent with the use of geolocation for public grievance reporting discussed in previous research [9].

The role-based interfaces provide different functions for citizens, officers, and administrators. Citizens can submit and track complaints, officers can access assigned grievances and update their progress, and administrators can monitor and manage grievance records. This supports the structured citizen-government interaction and administrative monitoring considered in earlier systems [1], [7].

B. Discussion

The implementation demonstrates the feasibility of combining AI-assisted processing, complaint routing, geographical information, status tracking, and role-based management within a single grievance-management platform. Instead of requiring separate mechanisms for complaint registration, departmental assignment, and location identification, SPGMS connects these functions through a common workflow. A significant aspect of the system is the integration of geographical information with complaint records. A textual description alone may not precisely identify the location of a public issue, whereas storing latitude and longitude provides officers with additional information for locating the reported problem. This

follows the direction of previous research involving geolocation-supported grievance systems [9].

The AI-assisted component provides support for complaint classification and departmental routing. Previous research has investigated automated civic complaint categorization [2], intelligent routing [4], and automated grievance registration [5]. SPGMS applies these concepts as part of a broader end-to-end grievance workflow.

The system also provides a structured separation of responsibilities through role-based interfaces. This allows citizens to report issues, officers to handle assigned complaints, and administrators to monitor the overall process. Such integration is related to the broader goals of smart governance and citizen-government engagement identified in previous studies [1], [7].

However, the effectiveness of the AI-assisted processing depends on the quality and clarity of the submitted complaint information. Ambiguous or incomplete descriptions may affect classification and routing. Similarly, geographical functionality depends on the availability of location services and the accuracy of the position selected by the citizen. Therefore, further evaluation using a larger collection of real-world grievances would be required to quantitatively measure classification accuracy, routing accuracy, processing time, and other performance metrics.

VI. CONCLUSION

The Smart Public Grievance Management System (SPGMS) provides an integrated web-based approach for managing public grievances from submission to resolution. The system combines citizen grievance registration, AI-assisted complaint processing, departmental routing, geographical location, status tracking, and administrative monitoring within a unified platform.

The integration of geographical information allows citizens to associate complaints with specific locations, while officers can use the stored location information when handling reported issues. The AI-assisted module supports complaint classification and departmental routing, reducing the dependence on completely manual processing. Role-based interfaces further organize the responsibilities of citizens,

officers, and administrators throughout the grievance lifecycle.

The proposed system demonstrates the feasibility of combining the capabilities explored in previous research on smart governance, automated complaint categorization, intelligent routing, citizen-government interaction, and geolocation-supported grievance management [1]– [10]. However, further evaluation with larger real-world grievance datasets is required to quantitatively assess classification accuracy, routing performance, processing time, and overall system effectiveness.

Future development can focus on improving AI-assisted processing, expanding grievance categories and departmental rules, enhancing location-based functionality, and conducting larger-scale performance evaluations. Overall, SPGMS establishes a structured technological framework for improving the organization and management of public grievances through a single integrated platform.

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