

Smart City Complaint Management System

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Abstract—Rapid urbanization has led to a rise in civic issues such as potholes, garbage overflow, streetlight failures, and drainage problems. Traditional complaint management systems rely on manual processes that are slow, inefficient, and lack transparency. The Smart City Complaint Management System provides a web-based platform for citizens to report civic issues easily. Users can submit complaints with clear descriptions and supporting images for better understanding. Administrators manage complaints through a centralized dashboard with real-time status updates. The system improves efficiency, accountability, and communication between citizens and city authorities.

Index Terms—Smart City, E-Governance, Web Application, Civic Issues, Complaint Management System.

I. INTRODUCTION

The need for effective management of public services and civic infrastructure has grown due to rapid urban growth. widespread concerns including drainage challenges, rubbish accumulation, streetlight failures, and road damage become increasingly widespread as cities grow, necessitating prompt repair. Maintaining urban functionality and guaranteeing a good quality of life for residents depend on the effective management of these issues. Conventional reporting techniques, such as in-person visits and unofficial routes of contact, are still used in many urban areas to handle complaints. These methods frequently lack adequate tracking, coordination, and transparency, which leads to unanswered complaints and delayed solutions. While municipal officials struggle to handle high amounts of complaints across several departments, citizens are frequently left in the dark about the status of their concerns. Initiatives for smart cities encourage the use of digital governance models that prioritize efficiency, openness, and citizen involvement.

Complaint management systems are essential to this architecture because they offer organized channels for reporting and addressing public concerns. A well-thought-out digital system can provide better coordination, lessen administrative burden, and increase citizen-authority communication.

The Smart City Complaint Management System described in this paper provides a centralized, web-based platform for filing, handling, and keeping track of public complaints. The suggested system makes it possible for citizens to file thorough complaints and for administrators to effectively monitor, classify, and address problems. The system facilitates efficient urban governance and supports the goals of smart cities by increasing accountability and response effectiveness.

1.1 Significance of Smart City Complaint Management

A crucial element of citizen-focused governance is effective complaint handling. In addition to preventing service deterioration, prompt resolution of civic concerns increases public confidence in local government. Additionally, digital complaint systems produce useful data that can be utilized to pinpoint persistent issues and enhance service planning. These technologies empower citizens and allow authorities to better assess performance and allocate resources by streamlining grievance reporting and increasing transparency. This enhances the quality of public services and promotes sustainable urban growth.

1.2 Theoretical Background

1.2.1 Smart City and E-Governance Concepts

Digital technologies are essential to smart cities because they improve public involvement, service delivery, and government. Through automated and

transparent procedures, e-governance systems facilitate effective communication between citizens and authorities.

1.2.2 Complaint Management Systems

Systems for managing complaints offer organized ways to file, monitor, and settle complaints. They assist authorities in identifying service shortages and guaranteeing accountability in urban environments.

1.2.3 Web-Based Civic Platforms

By enabling citizens to report problems from a distance, web-based platforms increase accessibility. Additionally, they facilitate scalable service delivery and centralized data administration.

1.2.4 Role of Automation and Digital Platforms

Automation increases productivity by decreasing the need for human intervention in the tracking and classification of complaints. By maintaining records and providing real-time updates, digital platforms enhance transparency even more.

1.2.5 Urban Governance Context

Responsiveness and accountability are key components of contemporary urban governance. Digital complaint system integration facilitates well-informed decision-making and effective handling of expanding urban needs.

II. LITERATURE SURVEY

Research on complaint management systems has emphasized the need to improve efficiency and transparency in urban grievance redressal mechanisms. Traditional complaint handling approaches, which rely on manual reporting and record maintenance, were found to be slow, error-prone, and lacking proper monitoring, often leading to delayed resolutions and poor accountability [1].

With advancements in web technologies, several e-governance platforms were developed to allow citizens to submit complaints online. These systems improved accessibility and reduced the need for physical interaction with municipal offices. However, many early web-based solutions lacked automated complaint categorization and intelligent routing, resulting in continued administrative workload and limited operational efficiency [2]. Further studies introduced centralized dashboards and role-based access control to enhance monitoring and responsibility assignment. While these systems

improved complaint tracking and transparency, scalability issues were observed during periods of high complaint volume, affecting system performance and response times [3]. Additionally, limited analytical capabilities restricted the ability to identify complaint trends and evaluate departmental performance [4].

Data security and privacy have also been identified as major concerns in existing complaint management platforms. Several studies highlighted inadequate protection of citizen data, emphasizing the need for secure authentication, controlled access, and reliable data storage mechanisms [5]. Recent research stresses that complaint management systems must align with smart city frameworks by incorporating scalability, automation, and future-ready technologies to support sustainable urban governance [6].

Overall, the literature indicates that although digital complaint management systems have evolved, significant gaps remain in automation, scalability, analytics, and security. These limitations justify the need for a comprehensive Smart City Complaint Management System that addresses the shortcomings of existing solutions.

III. METHODOLOGY

The Smart City Complaint Management System's approach is centered on creating a digital framework for managing public complaints that is organized, transparent, and scalable. The suggested method seeks to replace dispersed, manual complaint-handling procedures with a centralized web-based system that facilitates effective citizen-municipal government communication.

3.1 Existing System

Civic complaints are typically reported through phone calls, in-person visits to municipal offices, or unofficial routes of communication in traditional urban governance schemes. The grievance redressal procedure is sluggish and uneven since these approaches mostly rely on manual record-keeping and one-on-one follow-ups. Unstandardized categorization of complaints frequently results in misrouting, duplication, or neglect. Both citizens and authorities are unable to adequately monitor the development of complaints in the absence of a centralized tracking tool. Administrators do not have

real-time visibility into ongoing or persistent concerns, and citizens are rarely updated on the status of their complaints. While there are some digital solutions, their scalability and efficacy are limited because many of them just serve as simple submission gateways and still require human participation for processing.

3.2 Proposed System

A Smart City Complaint Management System is suggested to get around these restrictions by using web technology to automate and streamline the grievance processing procedure. All complaints are kept, handled, and tracked via a single platform thanks to the system's centralized architecture. Through an online interface, citizens can register complaints by entering pertinent information about the problem, including its nature, location, description, and supporting photos. To ensure traceability throughout its history, each complaint that is submitted is given a unique identifier and kept in a centralized database.

Administrative users can analyze incoming complaints, classify them according to pre-established civic issue kinds, and allocate them to the relevant departments using a dedicated dashboard. The system ensures that the progress of complaints is recorded at every level until they are resolved by supporting structured status updates. This strategy increases transparency for all parties involved, decreases response times, and improves accountability.

3.2.1 System Workflow

User authentication is the first step in the system workflow. Next, complaints are sent via an online form. After being filed, the complaint has an initial status in the database that indicates successful registration. After reviewing the complaint information, administrative users allocate it to the appropriate department for handling. The complaint's status is updated as it proceeds through different phases of settlement, enabling ongoing observation by administrators and public alike.

3.2.2 Complaint Categorization and Assignment

Sanitation, road upkeep, water supply, drainage, and public lighting are some of the pre-established classifications into which complaints are divided. Categorization guarantees that complaints are sent to the proper authorities without needless delays and helps to expedite the complaint routing process. This organized classification increases resolution efficiency and decreases manual labour.

3.2.3 User and Administrative Interaction Modules

Administrators and citizens can interact with the system in several ways. The public can file complaints, see the history of complaints, and monitor the progress of their resolution. Through a single interface, administrators may oversee complaint assignments, update progress, and keep an eye on system performance as a whole. This division of labour guarantees accountability clarity and restricted access to system features.

3.2.4 Data Management and Processing

To guarantee consistency and dependability, all complaint-related data is kept in a single database. Monitoring and reporting tasks are supported by the effective retrieval and analysis of complaint records made possible by structured data storage. As metropolitan populations increase, the system's scalability is supported, enabling it to manage rising complaint volumes.

3.2.5 Security and Access Control

Role-based access control and authentication techniques are used to address security concerns. Administrative access is restricted according to designated roles and responsibilities, whereas citizens are only permitted to examine and handle their own concerns. These precautions aid in preserving the system's integrity and safeguarding private user data.

IV. SYSTEM EVALUATION

In contrast to traditional grievance management methods, the Smart City Complaint Management System's functional correctness, efficiency, and usability are evaluated. The study places more emphasis on user interaction, workflow effectiveness, and practical performance than theoretical benchmarks because the system is intended to be a web-based civic platform.

4.1 Functional Evaluation

To confirm whether the system achieves its goals, a functional review was carried out. To make sure that citizens can file complaints by entering pertinent information including issue category, description, and supporting photographs, the complaint submission module was tested. A unique identifier was successfully issued to every complaint that was submitted, allowing for systematic tracking during the resolution process. The administrative module's

capacity to examine, classify, and assign complaints to the proper departments was assessed. To guarantee accuracy and consistency, status updates at various complaint handling stages were checked.

Without the need for human participation, the system efficiently preserved complaint records and enabled administrators and citizens to track developments. These findings show that the system meets its fundamental functional needs.

4.2 Performance Evaluation

The system's capacity to effectively manage numerous complaints while remaining responsive was the main focus of the performance evaluation. The system showed steady performance during testing when handling concurrent administrative updates and complaint filings. The efficient retrieval and processing of complaint records was made possible by centralized data storage and organized procedures.

The suggested platform greatly decreased the time needed for complaint registration, assignment, and tracking as compared to conventional manual solutions. Delays brought on by misunderstandings and manual record processing were reduced by the digital workflow. Preliminary testing indicates that the architecture is scalable and able to handle higher complaint volumes in metropolitan settings, even though the system has not been tested under extensive real-world deployment.

4.3 Usability and Transparency Assessment

The ease of interaction for both administrators and citizens were used to evaluate usability. It was discovered that the citizen interface was user-friendly, making it simple for those with little technical expertise to file and monitor complaints. Effective monitoring and decision-making were supported by the administrative dashboard, which offered a clear summary of complaints that were outstanding, in progress, and resolved. Real-time status updates and easily available complaint records improved transparency. Administrators had better insight into departmental performance, and citizens could monitor the status of their complaints without the need for frequent follow-ups. Increased confidence between the public and local government is facilitated by this degree of openness.

4.4 Comparative Analysis

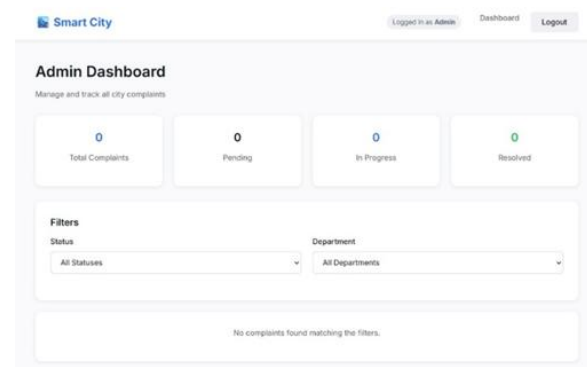
The suggested system delivers significant gains in accountability, efficiency, and organization over conventional complaint handling techniques. The digital approach guarantees organized complaint processing and uniform documentation, while manual techniques mostly rely on human intervention and lack systematic tracking. An important improvement over current methods is the capacity to centralize complaint data and track resolution progress.

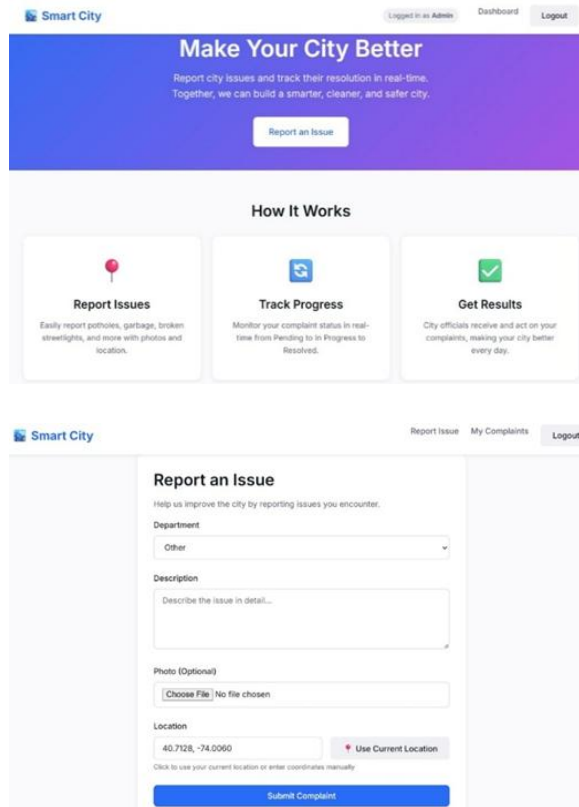
V. RESULTS

Functional testing of the main components of the proposed Smart City Complaint Management System complaint submission, classification, assignment, and status tracking was used to assess the system. The system assigned distinct identities for efficient tracking and successfully entered complaint details into a centralized database.

By effectively directing complaints to the relevant departments, the classification process reduced administrative handling ambiguity. Real-time complaint status visibility was made possible via the administrative dashboard, which enhanced cooperation and allowed for prompt modifications. Without the need for many follow-ups, citizens could track the status of their complaints.

The solution showed better organization, transparency, and workflow efficiency when compared to conventional grievance handling techniques. Structured digital processes reduced manual delays and inconsistent records. These findings show that the suggested system successfully achieves its goals and facilitates appropriate handling of public complaints.





The image displays the user interface of a Smart City Complaint Management System. The top section features a blue header with the text "Make Your City Better" and a sub-header "Report city issues and track their resolution in real-time. Together, we can build a smarter, cleaner, and safer city." Below this is a "Report an Issue" button. The middle section, titled "How It Works", contains three cards: "Report Issues" (with a red pin icon), "Track Progress" (with a blue circular arrow icon), and "Get Results" (with a green checkmark icon). The bottom section shows a detailed "Report an Issue" form with fields for Department (a dropdown menu), Description (a text area), Photo (Optional) (a file upload button), and Location (a text field with coordinates and a "Use Current Location" button). A "Submit Complaint" button is at the bottom of the form.

VI. CONCLUSION

In order to improve the effectiveness, openness, and structure of managing civic grievances in urban settings, this paper introduced a Smart City Complaint Management System. The suggested system tackles major issues including slow answers, no tracking, and little accountability by substituting a centralized web-based platform with conventional, manual complaint reporting techniques. The technology makes it simple for residents to file and keep track of complaints, while administrators can use an organized digital workflow to handle, classify, and address problems. The evaluation's findings show that the suggested strategy improves departmental collaboration, lowers administrative work, and increases transparency into complaint handling procedures.

All things considered, the Smart City Complaint Management System shows promise as a useful digital governance instrument that facilitates responsive municipal management. The system can greatly aid in the creation of sustainable smart cities and better civic service delivery with more improvements and widespread implementation.

REFERENCES

- [1] P. Kormpho, et al., "Smart complaint management system," in Proc. ICT-ISPC, 2018.
- [2] S. Kazi, et al., "Smart e-grievance system for effective communication in smart cities," IEEE, 2023.
- [3] D. Sarafis, et al., "Technological survey on citizen complaint management systems and future advances," IEEE, 2016.
- [4] F. A. Alenezy, et al., "Fix-It: Design and implementation of a public complaint management system," IEEE, 2018.
- [5] C. F. Finola, et al., "Analysis of public complaint reports during COVID-19," 2020.
- [6] F. Shama, et al., "CitySolution: A complaining task distributive mobile application for smart city corporation using deep learning," 2021.