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Research Article

AUTOMATED PUBLIC COMPLAINT MANAGEMENT SYSTEM

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Abstract

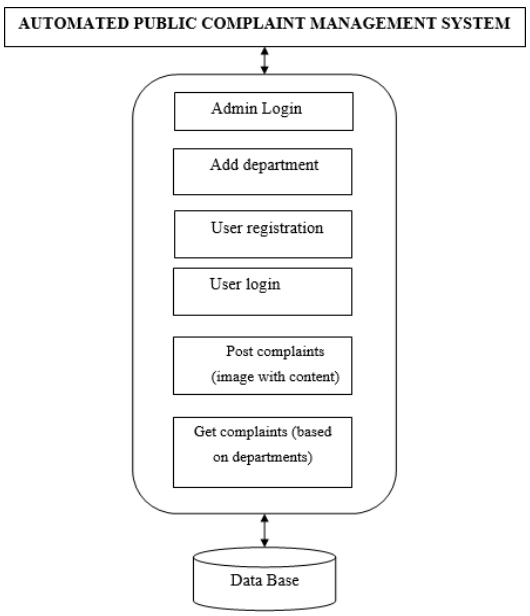
Public complaints are now handled in an ineffective, laborious, and human error-prone manner. Usually, complaints are filed via phone calls, emails, or paper forms. They are then manually categorized and forwarded to the relevant department. This results in a greater backlog of unresolved issues and response delays. A online application that enables users to post complaints together with related photographs and captions is introduced by the suggested system. The system automatically classifies complaints and forwards them to the appropriate department, such as the Electricity Board, Police, or Traffic, using cutting-edge technologies like images and captions. This automation guarantees faster responses, optimizes resource allocation, and increases the effectiveness of complaint handling. Users will receive real-time updates, guaranteeing openness and contentment. The proposed method seeks to increase overall complaint management efficiency, lessen administrative burden, and expedite public service delivery. The technology guarantees that complaints are addressed immediately and minimizes errors by minimizing human intervention. This creative strategy supports the objective of developing public services that are more user-centric and responsive. The ultimate goal of the solution is to maximize government agency operational operations while simultaneously raising citizen happiness.

Keywords - Real-Time Tracking, Complaint Categorization, Image-Based Complaint, Natural Language Processing (NLP), Sentiment Analysis, Data Analytics.

INTRODUCTION

To make the process of submitting, handling, and resolving complaints about municipal services more efficient, the "Automated Complaint System for Municipal Services" was created. By offering a more effective forum for reporting problems including trash management, road upkeep, water supply, sanitation, and other public concerns, the system seeks to improve communication between citizens and local authorities. As technology advances, this system uses automation to make sure that complaints are automatically sorted and sent to the right departments, which improves accountability and response times. The portal allows citizens to register, file complaints, and monitor the real-time status of their issues. In order to keep the public updated on the development of the complaints, the system also enables officers to update their status. To make sure that problems are not missed, the platform may also automatically remind officers to follow up on unanswered complaints. It offers a clear and efficient line of communication, fostering public and municipal authorities' trust. Municipal administrators may track complaint trends, spot reoccurring problems, and make data-driven decisions to enhance local services thanks to the system's analytics and reporting features. The goal of this automated method is to improve the effectiveness of municipal services while minimizing delays and human error. Municipalities may create a more accountable and responsive environment and ultimately raise the standard of living for their residents by implementing such a system. Urban development and the increasing population in cities have significantly increased the demand for efficient municipal services. Municipal authorities are responsible for managing essential public services such as waste management, road maintenance, water supply, sanitation, street lighting, and other civic infrastructure.

SYSTEM ARCHITECTURE



The Automated Public Complaint Management System is designed using a three-tier architecture that ensures scalability, efficiency, and smooth interaction between users and the system. The first layer is the presentation layer, which acts as the user interface through which citizens, officers, and administrators interact with the system. This layer provides features such as user registration, login, complaint submission with images, and real-time status tracking. The second layer is the application layer, which is developed using Python with the Flask framework. This layer is responsible for handling the core functionality of the system, including complaint processing, categorization using intelligent techniques, routing complaints to appropriate departments, and managing user authentication. The third layer is the data layer, which uses a MySQL database to store all relevant data such as user information, complaint details, department records, and status updates. When a user submits a complaint, the request is processed by the application layer, stored in the database, and forwarded to the respective department. Officers then update the complaint status, which is reflected back to the user, ensuring transparency and efficiency in the system.

WORKING METHODOLOGY

The development of the Automated Public Complaint Management System follows a structured methodology to ensure that the system meets user requirements and performs efficiently. Initially, the requirement analysis phase is conducted to understand the problems faced in existing manual complaint systems and to identify the needs of both citizens and municipal authorities. Based on this analysis, the system requirements such as complaint registration, tracking, and reporting are defined. The next phase involves system design, where the architecture, database structure, and workflow of the application are planned using tools such as Data Flow Diagrams and UML diagrams. Following the design phase, the system is developed by implementing the frontend interface, backend logic, and database integration. Once development is completed, the system undergoes various testing procedures, including unit testing, integration testing, system testing, and user acceptance testing to ensure reliability and accuracy. After successful testing, the system is deployed as a web application, making it accessible to users. Continuous maintenance and updates are carried out to improve performance and incorporate new features based on user feedback.

IMPLEMENTATION

The implementation of the Automated Public Complaint Management System is carried out as a web-based application that integrates multiple functional modules to ensure smooth operation. The user module allows citizens to register, log in, submit complaints with supporting images and descriptions, and track the progress of their complaints in real time. The admin module provides functionalities to manage users, monitor complaints, assign departments, and generate analytical reports. The officer module enables departmental staff to view complaints relevant to their department, analyze the issues, and update the complaint status accordingly. The system is developed using Python and the Flask framework for backend processing, while MySQL is used for database management. The frontend is designed using web technologies integrated with Flask templates. Additional features such as image uploading, automated complaint classification, and sentiment analysis enhance the system's functionality and efficiency. The implementation ensures that all modules are interconnected and operate seamlessly to provide a user-friendly experience.

ADVANTAGES

The Automated Public Complaint Management System offers several advantages over traditional manual complaint handling methods. It significantly reduces the need for manual intervention by automating the complaint registration and routing process, thereby minimizing human errors. The system ensures faster response times as complaints are immediately directed to the appropriate departments without delays. It provides transparency by allowing users to track the status of their complaints in real time, which builds trust between citizens and authorities. The use of intelligent classification techniques improves the accuracy of complaint categorization, ensuring that issues are handled by the correct department. Furthermore, the system enhances accessibility, as users can submit complaints from anywhere at any time through an online platform. The availability of analytical tools also helps administrators identify recurring problems and improve decision-making processes.

APPLICATIONS

The Automated Public Complaint Management System can be widely applied across various sectors to improve complaint handling and service delivery. In municipal corporations, it can be used to manage issues related to waste management, road maintenance, water supply, and sanitation. In smart city initiatives, the system can serve as an integrated platform for monitoring and resolving civic issues efficiently. Government organizations can utilize this system for public grievance redressal to enhance transparency and accountability. Educational institutions can adopt similar systems to handle complaints related to campus facilities, while private organizations can use it as a customer complaint management system to improve customer satisfaction. The flexibility and scalability of the system make it suitable for implementation in diverse environments.

FUTURE ENHANCEMENTS

Although the current system effectively addresses the challenges of complaint management, several enhancements can be introduced to further improve its capabilities. The development of a mobile application would make the system more accessible and convenient for users, allowing them to submit and track complaints directly from their smartphones. Integration with Geographic Information Systems (GIS) would enable users to pinpoint the exact location of issues, helping authorities respond more efficiently. The incorporation of advanced artificial intelligence techniques could improve complaint classification and prioritization, ensuring that urgent issues are addressed promptly. Adding multi-language support would make the system more inclusive for users from different linguistic backgrounds. Features such as real-time notifications through SMS or email, voice-based complaint submission, and blockchain-based data security can further enhance the system's usability, accessibility, and reliability. Additionally, a public dashboard displaying complaint statistics can increase transparency and public trust.

CONCLUSION

he Automated Public Complaint Management System represents a modern solution to the challenges faced in traditional complaint handling processes. By leveraging automation, real-time tracking, and intelligent complaint routing, the system improves efficiency, transparency, and accountability in public service management. It provides a user-friendly platform for citizens to report issues and ensures that their complaints are addressed promptly by the appropriate authorities. The system also enables administrators to analyze data and make informed decisions to enhance service delivery. Overall, the implementation of this system reduces manual workload, minimizes errors, and strengthens communication between citizens and municipal authorities, ultimately contributing to improved governance and better quality of life.

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