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CENTRALIZED CITY COMPLAINT PORTAL WITH CITIZEN REPORTING AND STATUS TRACKING DEPENDENT FEEDBACK ANALYTICS

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ABSTRACT

Rapid urbanization has significantly increased the demand for efficient civic services and responsive urban governance. City administrations are responsible for resolving a wide range of public issues, including road damage, waste accumulation, water supply interruptions, streetlight failures, and sanitation-related problems. However, in many municipalities, citizen complaints are still handled through traditional methods such as phone calls, written applications, or in-person visits to government offices. These manual processes often lack proper documentation, transparency, and real-time tracking, making complaint management slow and inefficient. Delayed responses, poor coordination among departments, loss of complaint records, limited accountability, and the absence of a centralized monitoring mechanism reduce the overall effectiveness of civic service delivery. As urban populations continue to grow, these challenges emphasize the need for a scalable and technology-driven complaint management solution. The research introduces a centralized web-based platform that enables citizens to report civic issues, upload relevant information, and monitor complaint status throughout the resolution process. The system allows administrators to categorize complaints, assign them to appropriate departments, update progress, and monitor service performance through a unified dashboard. Developed using React and CSS for the frontend, Node.js for backend processing, and MySQL for database management, the platform ensures secure access, reliable data handling, and efficient workflow management. The proposed system enhances transparency, improves response efficiency, strengthens citizen participation, and supports informed decision-making, ultimately contributing to accountable governance and smarter, more responsive urban civic service management.

Keywords: Civic Complaint Management, Smart City, E-Governance, Workflow Management, Citizen Engagement, React-Node.js Framework

1. INTRODUCTION

Rapid urbanization and the continuous expansion of modern cities have considerably increased the demand for efficient civic services and responsive urban governance. Citizens regularly encounter a wide range of urban problems, including defective streetlights, damaged roads, overflowing garbage, water and sewage leakages, noise pollution, hazardous trees, stray animals, and insect breeding sites that threaten public health. These issues directly affect the quality of life and require prompt attention from municipal authorities. However, despite the increasing number of complaints, many city administrations continue to manage these issues through fragmented, department-specific processes where each category of complaint is handled independently. Such isolated approaches result in inconsistent service delivery and inefficient utilization of municipal resources, even though many civic problems share similar reporting, monitoring, and resolution requirements [1].

Existing complaint management systems generally maintain complaint records within individual departments, limiting information exchange and reducing coordination among municipal agencies. This fragmented structure makes it difficult for authorities to obtain a

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comprehensive view of city-wide issues and prevents effective collaboration during problem resolution. Citizens also face challenges in tracking the status of their complaints due to the absence of transparent communication mechanisms [2]. With the growing adoption of smart city technologies, researchers have emphasized the importance of shared digital infrastructures that integrate multiple municipal services into a centralized platform. Such systems enable standardized complaint handling, improve operational efficiency, support inter-departmental collaboration, and facilitate data-driven decision-making for better urban service management [3].

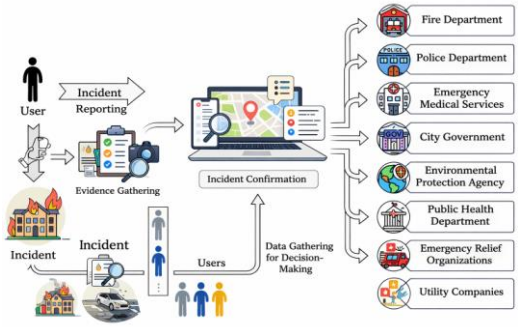


Fig. 1: Centralized city problem reporting system

Another significant challenge in urban governance is the accurate identification and reporting of civic issues, particularly with respect to their exact locations. Even routine maintenance tasks, such as repairing a faulty streetlight or clearing a blocked drainage system, become difficult when precise location information is unavailable [4]. The absence of structured reporting mechanisms, ineffective communication channels, and inadequate planning often delay complaint resolution and reduce overall service quality. Infrastructure-related issues such as potholes present serious safety risks to motorists, cyclists, and pedestrians when not repaired in a timely manner. This concern is reflected in the city of São Paulo, Brazil, which recorded 1,086 pothole-related complaints during the first quarter of 2024, illustrating the growing need for centralized citizen reporting and complaint tracking systems that support faster response times, greater transparency, and more effective urban governance [5].

1.2 Problem Definition

Urban administrations face ongoing difficulties in managing and resolving city-related issues due to the use of fragmented and manual complaint handling methods such as phone calls, emails, and paper records. These approaches lack a centralized system for recording, categorizing, and tracking complaints, resulting in delayed responses, miscommunication between departments, and loss of complaint information. Citizens often do not receive clear updates on the status of their reported issues, which reduces trust in civic authorities. Additionally, the absence of unified monitoring and structured data makes it difficult for administrators to prioritize problems, ensure accountability, and analyse recurring issues. These limitations highlight the challenges of traditional city complaint management systems and their impact on effective urban governance.

2. LITERATURE SURVEY

Reethika A, et al. [6] proposed a Smart City Complaint Management System (SCCMS), a scalable web-based application developed using Flask to improve urban complaint reporting and civic engagement. The system enabled citizens to securely register, authenticate, and submit complaints related to infrastructure, sanitation, traffic, public safety, and other civic services through a user-friendly interface. Citizens could monitor the status of their complaints using a personalized dashboard, while administrators managed complaints, updated their progress, and analysed complaint trends through a dedicated administrative portal. The implementation incorporated password hashing and session-based authentication to ensure secure user access and data privacy. Furthermore, its modular architecture supported future scalability and feature enhancement, while a

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real-time analytics module generated valuable insights into complaint patterns and service efficiency, assisting authorities in making informed administrative decisions. Prathamesh Parsai, et al. [7] introduced *Jan Suvidha*, a civic-tech mobile application designed to strengthen communication between citizens and municipal authorities in India. The application allowed users to report civic problems such as potholes, garbage accumulation, and malfunctioning streetlights using geo-tagged information, enabling authorities to identify complaint locations accurately. It also supported real-time complaint tracking, improved transparency throughout the grievance resolution process, and encouraged greater citizen participation in governance. Kumar A and Verma R [8] emphasized the growing role of Information and Communication Technology (ICT) in transforming public service delivery through digital governance. The study highlighted that mobile applications and e-governance platforms significantly improved administrative efficiency, reduced operational costs, and enhanced accessibility to government services. The authors further noted that integrating digital infrastructure with government processes enabled better coordination, streamlined service delivery, and strengthened interactions between citizens and public authorities.

Pujari Varun, et al. [9] proposed an Online Complaint Management System (OCMS) that utilized web technologies and automated workflows to improve grievance redressal processes across government organizations and public service departments. The system enabled users to register complaints online, monitor complaint progress, and receive real-time updates, thereby improving transparency, accountability, and service responsiveness. The proposed architecture automated complaint registration, tracking, and resolution while reducing processing delays and administrative workload. The study also discussed future enhancements such as integrating machine learning techniques for intelligent complaint classification and prioritization, making the platform more adaptable to large-scale deployments. C. Soni, et al. [10] developed a web-based complaint management system that modernized conventional grievance handling mechanisms by replacing manual complaint processing with an automated digital workflow. The proposed platform enabled citizens to submit complaints online, track their status in real time, and receive timely updates throughout the resolution process. This automation improved operational efficiency, increased system reliability, and encouraged greater citizen engagement with public services. S. Verma, et al. [11] developed a cloud-based complaint management system for public service organizations that significantly reduced complaint resolution time through automated categorization, intelligent task assignment, and notification mechanisms. The system ensured that complaints were immediately forwarded to the appropriate departments while automated reminders maintained continuous progress. The inclusion of transparent progress tracking, real-time notifications, and an intuitive user interface improved citizen satisfaction and strengthened public confidence in government service delivery.

S. Gupta and S. Aggarwal [12] proposed the implementation of mobile-based complaint management systems within smart city environments to enhance citizen participation and simplify grievance reporting. The study highlighted the increasing adoption of smartphone applications as an efficient medium for submitting complaints and monitoring their progress, enabling governments to improve responsiveness and service accessibility. S. Mehta, et al. [13] developed an integrated platform supporting the complete road maintenance lifecycle, beginning with fault reporting and extending to maintenance planning and execution. The proposed system

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combined multiple heterogeneous data sources to improve interoperability and facilitate efficient information retrieval, enabling faster identification and resolution of road-related issues. The platform was successfully evaluated through a real-world case study conducted for the municipality of Catania and demonstrated its adaptability for implementation in other smart cities. R. Kaur and S. Tiwari [14] emphasized the integration of IoT and complaint management systems to strengthen collaboration between citizens and public administrations in modern urban environments. The authors proposed a semantic web-based urban fault reporting platform that enabled citizens to report issues such as potholes, damaged streetlights, and road defects while supporting municipal authorities in responding more efficiently. By utilizing semantic data models and linked open data principles, the platform integrated multiple urban data sources, improving interoperability, information sharing, and the effectiveness of smart city maintenance services.

3. PROPOSED SYSTEM

The research city help desk system as shown in Fig. 2 is designed as a centralized digital solution to address the challenges associated with managing city-related problems. The methodology focuses on establishing a unified platform where citizens can report issues such as infrastructure damage, sanitation concerns, water supply failures, and public utility faults through a single online interface. Each complaint is captured with essential details including category, location, description, and supporting information, ensuring accurate problem identification. By storing all complaint data in a centralized database, the system eliminates fragmented handling across departments and creates a structured foundation for effective coordination and monitoring.

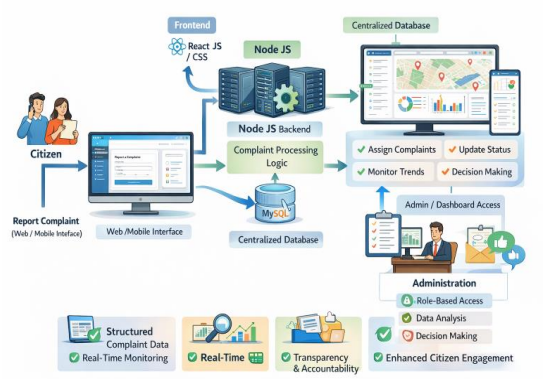


Fig. 2: System architecture for proposed resident clean schedule

From an administrative perspective, the proposed methodology enables city authorities to systematically manage reported issues through role-based access and controlled workflows. Administrators can review incoming complaints, assign them to relevant departments, and monitor progress through status updates and activity logs. Citizens are kept informed through status tracking mechanisms, which enhance transparency and accountability. The availability of historical complaint data supports performance evaluation, trend analysis, and better planning of civic services. Overall, the methodology promotes efficient service delivery, data-driven governance, and improved interaction between citizens and municipal authorities.

3.1 Node JS

Node.js is a server-side runtime environment as shown in Fig. 3 that allows JavaScript to be executed outside the browser for building scalable and high-performance backend applications. It is built on an event-driven, non-blocking I/O model, which enables it to handle multiple client requests efficiently using a single-threaded architecture. Node.js acts as an intermediary between the frontend and the database by receiving requests, processing business logic, performing data operations, and returning responses, making it well-suited for real-time and data-intensive applications.

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Request Reception: Node.js receives incoming HTTP requests from clients through the server listener. These requests may include data retrieval, submission, or update operations. The server remains active and ready to handle multiple requests concurrently.

Routing and Endpoint Handling: The request is passed to the routing layer, where it is mapped to a specific API endpoint. Based on the request URL and method, the appropriate handler function is selected. This ensures organized request processing.

Middleware Processing: Middleware functions execute before core logic to perform tasks such as request validation, authentication checks, logging, and error handling. These functions control request flow and enhance security and reliability.

Business Logic Execution: The request handler executes application-specific logic such as data processing, calculations, or decision-making. This layer determines how the request should be handled and what operations are required.

Database Interaction: Node.js communicates asynchronously with the database to perform operations such as insert, update, delete, or retrieve data. Non-blocking execution ensures that other requests are not delayed during database access.

Response Generation and Delivery: After completing all operations, Node.js constructs a response and sends it back to the client. The response typically contains data or status information, completing the request-response cycle.

4. RESULTS AND DISCUSSION

Fig. 3 illustrates the citizen dashboard after the successful resolution of a reported civic issue. The dashboard enables citizens to review the complete details of the submitted complaint, including the issue description, assigned worker, and current resolution status. It also provides a feedback mechanism through which users can share their experience regarding the quality of the completed service. The system maintains transparency by allowing citizens to verify that the complaint has been resolved and closed successfully. This functionality improves user satisfaction, strengthens accountability, and encourages active citizen participation in civic governance.

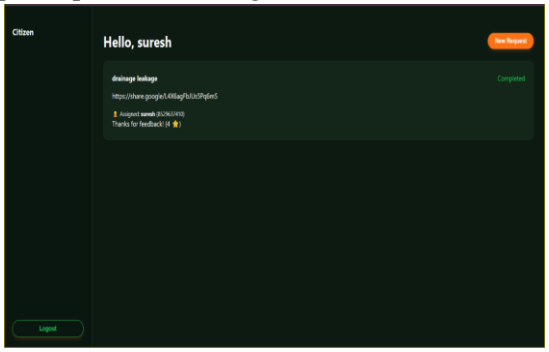


Fig 3: Citizen dashboard after resolution of the raised issue including feedback

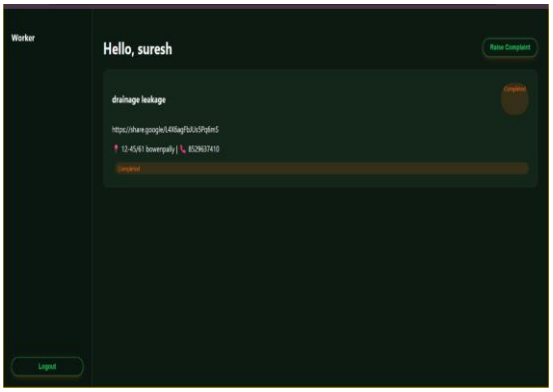


Fig. 4: Worker dashboard after completion of work

Fig. 4 depicts the worker dashboard after the completion of the assigned complaint resolution task. The dashboard allows workers to access the details of assigned complaints, update their progress, and mark tasks as completed after resolving the reported issue. It serves as a centralized interface for managing field operations and maintaining accurate records of completed work. The updated complaint status is immediately reflected throughout the system, ensuring seamless communication between workers,

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administrators, and citizens. This functionality enhances operational efficiency, improves task monitoring, and supports timely service delivery.

Fig. 5 presents the administrator dashboard displaying the details of registered citizens in the complaint management system. The dashboard provides administrators with a centralized interface for viewing and managing citizen information while maintaining organized user records. It supports administrative operations such as verifying registered users and managing citizen accounts whenever necessary. The centralized management of user information improves system organization and simplifies overall platform administration. This feature contributes to secure user management and efficient maintenance of citizen records.

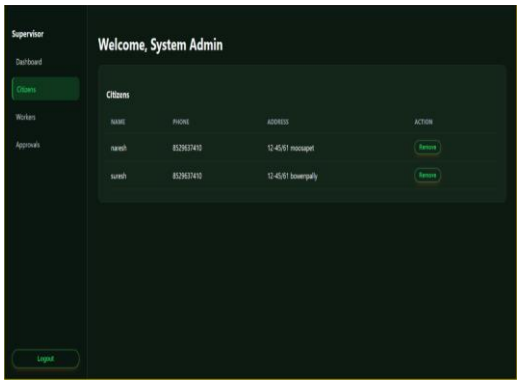


Fig. 5: Admin dashboard showing citizens

Fig. 6 depicts the administrator dashboard displaying the registered workers responsible for handling civic complaints. The dashboard enables administrators to monitor worker information, manage personnel records, and supervise the workforce involved in complaint resolution activities. It provides a centralized mechanism for maintaining accurate worker data and supporting effective allocation of responsibilities. By offering better visibility into workforce management, the system improves administrative control and facilitates efficient coordination among field personnel. This functionality contributes to enhanced service management and the effective delivery of municipal services.

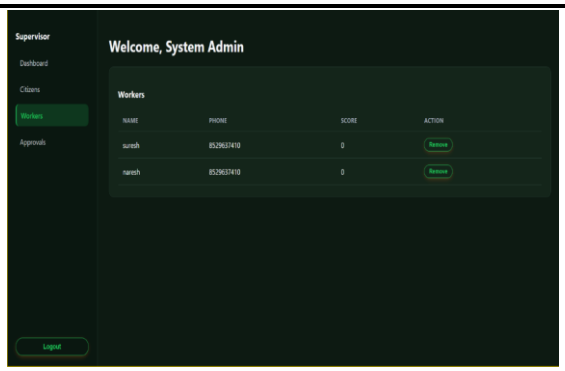


Fig. 6: Admin dashboard showing workers

5. CONCLUSION

This research successfully demonstrates the effectiveness of a centralized digital platform in improving the reporting and management of city-related problems. By providing a unified interface for citizens to submit complaints and track their status, the system addresses key limitations of traditional manual complaint handling methods. The integration of a responsive frontend, a scalable backend, and a structured relational database ensures reliable data management, transparent workflows, and efficient coordination between administrators and city departments. The system enhances accountability by maintaining detailed records of complaint submission, assignment, and resolution activities. Role-based access control ensures that users interact only with functionalities relevant to their responsibilities, reducing errors and improving operational clarity. The results indicate that the city help desk system reduces response delays, minimizes miscommunication, and supports informed decision-making through centralized monitoring and data visualization. Overall, the system contributes to improved civic service delivery and strengthened trust between citizens and municipal authorities.

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