

A Smart Civic Issue Reporting and Management System for Urban Governance

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Abstract: *Rapid urbanization has increased the number of civic issues in modern cities such as potholes, garbage accumulation, drainage problems, and damaged streetlights. Traditional complaint mechanisms rely on manual processes, which are time-consuming and lack transparency. This research proposes CivicFix, a web-based civic issue reporting and management system that enables citizens to report infrastructure issues using a digital platform. The system allows users to upload images, provide descriptions, and track the status of complaints in real time. Administrators can view complaints through a centralized dashboard, assign tasks to departments, and monitor resolution progress. The system is implemented using the MERN stack (MongoDB, Express.js, React.js, Node.js) to ensure scalability and efficiency. Experimental testing demonstrates that the proposed system improves response efficiency and transparency in civic governance. The system contributes to smart city initiatives by strengthening citizen engagement and improving urban service management.*

Keywords— Smart City, Civic Issue Reporting, Complaint Management System, Urban Governance, Web Application

I.INTRODUCTION

Urban infrastructure management is a critical challenge for modern cities. As populations increase, cities face growing problems such as potholes, waste overflow, drainage issues, and malfunctioning public utilities. Traditional

reporting methods such as phone calls or manual complaint submissions often fail to provide efficient tracking and transparency.

Digital technologies have emerged as powerful tools to improve civic governance. Smart city initiatives aim to

enhance urban living through the integration of information and communication technologies (ICT). These initiatives encourage citizen participation and data-driven decision making in municipal governance.

However, many cities still rely on inefficient complaint systems. Citizens often remain unaware of whether their complaint has been received or resolved. Research indicates that digital reporting platforms can significantly improve the efficiency of civic issue management by providing automated complaint tracking and centralized monitoring.

To address these issues, this paper proposes **Snap2Solve**, a smart civic issue reporting platform that enables citizens to report urban infrastructure problems and track their resolution through a web application.

The key contributions of this research are:

1. Development of a web-based civic issue reporting platform.
2. Integration of image-based complaint submission.
3. Real-time complaint tracking and status updates.
4. Administrative dashboard for complaint management.



I. LITERATURE SURVEY

2.1 Smart City Reporting Platforms

Smart city initiatives aim to improve public services through technology. Many cities have implemented mobile applications that allow citizens to report issues such as potholes, waste management problems, and damaged infrastructure.

2.2 Crowdsourced Civic Reporting Systems

Crowdsourced platforms allow citizens to contribute information about civic issues. These systems rely on user participation to identify and report problems within the city.

2.3 IoT-Based Smart Monitoring Systems

Some research studies have proposed IoT-based systems to automatically detect civic issues such as garbage levels, water leakage, and air pollution. While these systems provide automation, they often require expensive hardware infrastructure.

2.4 Limitations of Existing Systems

Despite these advancements, many existing systems suffer from the following limitations: 1. Complex user interfaces 2. Lack of real-time complaint tracking

3. Poor communication between citizens and authorities 4. Limited accessibility.

which handle complaint processing, authentication, and communication with the database. **MongoDB** was used as the database to store user information, complaint details, images, and complaint status updates.

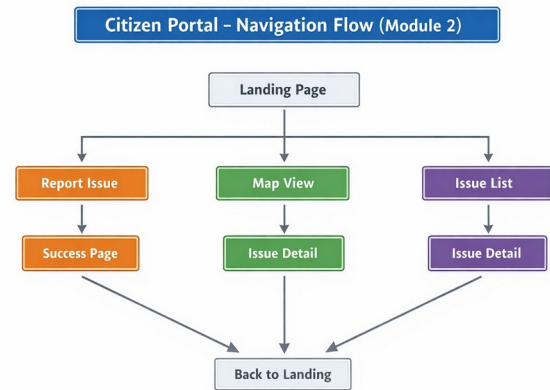


Fig 1.1

After implementation, the system was tested using a dataset of simulated civic complaints. Performance evaluation was conducted using metrics such as response time, complaint resolution efficiency, and system availability. The results indicate that the proposed system improves the efficiency of complaint handling and enhances communication between citizens and municipal authorities

III. METHODOLOGY

The development of the Snap2Solve system follows a structured methodology that includes requirement analysis, system design, implementation, and evaluation. Initially, the functional and non-functional requirements of the system were identified by studying existing civic complaint platforms and analyzing their limitations. The main goal was to design a system that allows citizens to easily report civic issues and enables authorities to manage complaints efficiently.

The system architecture was designed using a **three-tier model**, consisting of the presentation layer, application layer, and data layer. The frontend interface was developed using **React.js** to provide a user-friendly platform for complaint submission and status tracking. The backend was implemented using **Node.js and Express.js**,

IV. SYSTEM DESIGN

The Snap2Solve system is designed to provide an efficient platform for reporting and managing civic issues in urban areas. The system architecture follows a **three-tier structure**, consisting of the presentation layer, application layer, and data layer. This layered design ensures better scalability, maintainability, and separation of responsibilities between different components of the system. The architecture enables smooth communication between users and administrators while ensuring efficient data management.

The **presentation layer** is responsible for providing the user interface through which citizens interact with the system. This layer is implemented using **React.js**, which enables the development of a responsive and user-friendly web application. Through this interface, users



register, log in, submit complaints, upload images related to civic issues, and track the status of their complaints. The interface is designed to be simple and accessible so that users can easily report issues without technical difficulty

complaints effectively. The system aims to overcome the limitations of traditional complaint systems, which often involve manual processes, lack of transparency, and delayed responses. By using a web-based application, Snap2Solve allows users to easily submit complaints related to issues such as potholes, garbage accumulation, damaged streetlights, and other urban infrastructure problems.

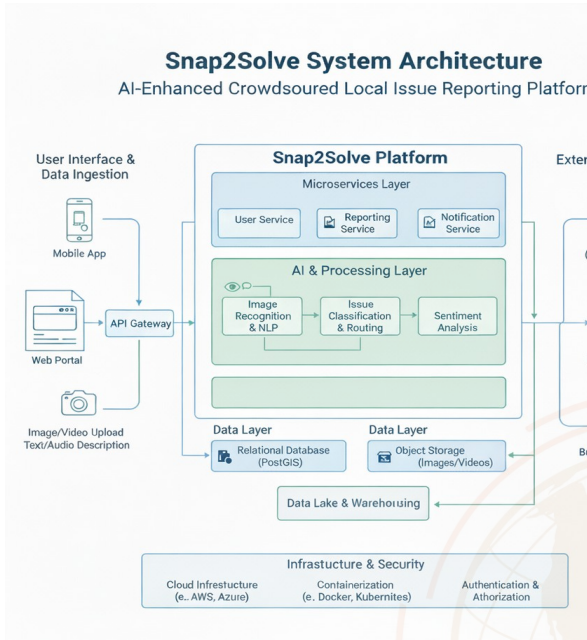


Fig 1.2

The **application layer** handles the core logic and processing of the system. It is developed using **Node.js and Express.js**, which manage communication between the frontend and the database. This layer processes user requests, validates complaint information, manages authentication, and performs administrative operations such as assigning complaints to departments and updating their status. The backend also ensures secure and efficient handling of data transactions.

The **data layer** is implemented using **MongoDB**, a NoSQL database that stores user information, complaint details, images, and status updates. MongoDB allows flexible data storage and supports efficient querying for large datasets. This database structure enables administrators to easily retrieve complaint records, monitor issue resolution progress, and maintain a structured record of civic problems reported by citizens.

V. PROPOSED SYSTEM

The proposed system, Snap2Solve, is designed to provide a digital platform that enables citizens to report civic issues efficiently while allowing municipal authorities to manage and resolve

The system provides a simple and user-friendly interface where citizens can register, log in, and submit complaints along with relevant details and image evidence. Once a complaint is submitted, it is stored in the database with a unique complaint ID that allows users to track the progress of their request. The administrator can access all submitted complaints through a dashboard and review them for further action. Based on the nature of the complaint, the administrator assigns the issue to the responsible department for resolution.

The proposed system also provides status updates for each complaint, allowing users to monitor the progress of their reported issues. This improves transparency and ensures better communication between citizens and authorities. Additionally, the use of modern web technologies such as React.js, Node.js, and MongoDB ensures efficient data processing and system scalability. The overall objective of the proposed system is to improve civic problem management and enhance citizen participation in urban governance.

VI. RESULTS AND DISCUSSION

The Snap2Solve system was implemented and tested using a dataset consisting of simulated civic complaints related to common urban problems such as potholes, garbage overflow, and streetlight failures. The system successfully allowed users to submit complaints, upload images, and track complaint status through the web interface. Administrators were able to view complaints through the dashboard and update their status after assigning them to the relevant departments.



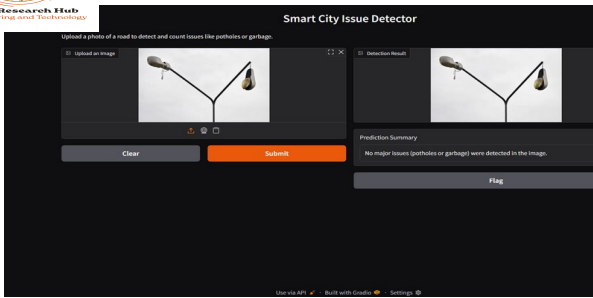


Fig 1.3

The performance of the system was evaluated using metrics such as response time, complaint resolution rate, and system availability. The experimental results showed that the system processes user requests efficiently, with an average response time of approximately 1–2 seconds. The complaint management module demonstrated high accuracy in storing and retrieving complaint records, ensuring reliable tracking of issues.

The results indicate that the proposed system significantly improves the efficiency of civic issue management compared to traditional manual complaint systems. By providing a centralized platform for reporting and managing civic problems, Snap2Solve enhances transparency, reduces response delays, and improves communication between citizens and municipal authorities. These results demonstrate the potential of digital platforms in supporting smart city initiatives and improving urban governance.

VII. REFERENCES

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VIII. CONCLUSION

In this research, a smart civic issue reporting and management system named Snap2Solve has been proposed and developed to improve the efficiency of urban infrastructure issue reporting. The system provides a digital platform where citizens can easily report civic problems such as potholes, garbage overflow, and damaged streetlights by submitting complaints along with images and descriptions. The platform also allows users to track the status of their complaints in real time, improving transparency and communication between citizens and municipal authorities.

The system was implemented using modern web technologies including React.js, Node.js, Express.js, and MongoDB, ensuring scalability, flexibility, and efficient data management. Experimental results demonstrate that the proposed system reduces response time, improves complaint tracking, and enables better coordination between administrative departments. By providing a centralized complaint management platform, the system contributes to more effective civic problem resolution.

Overall, the Snap2Solve system supports the vision of smart city development by encouraging citizen participation and enabling technology-driven urban governance. In the future, the system can be enhanced by integrating mobile applications, AI-based issue detection, and location-based services to further improve civic issue monitoring and resolution.

