



STREET CARE OPERATION PORTAL

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Abstract: The rapid growth of urban areas has increased the demand for efficient systems to manage civic issues and public infrastructure complaints. Traditional complaint management approaches often depend on manual procedures, phone calls, or fragmented digital systems, resulting in delayed response times, lack of transparency, and poor coordination between authorities and field workers. In recent years, modern web technologies and intelligent digital platforms have emerged as effective solutions for improving civic issue reporting and operational management. This paper presents a study on the application of the Street Care Operation Portal for centralized civic issue reporting, complaint management, and worker coordination. The proposed system enables citizens to report issues such as damaged roads, drainage blockages, waste accumulation, and streetlight failures by providing descriptions, media evidence, and live location information. The system architecture follows a modular client-server design where the backend manages authentication, issue processing, worker assignment, and data storage, while the frontend provides interactive dashboards for citizens, administrators, and field workers. Role-based access control, location-based services, and real-time status tracking improve operational transparency and accountability. Administrators can monitor reported issues, assign tasks to workers, and analyze system activity through visual dashboards, while field workers update issue resolution progress directly through the platform. The results demonstrate that the Street Care Operation Portal improves coordination, reduces manual effort, and enhances response efficiency compared to traditional civic complaint systems. The application is implemented as a web-based system using React.js on the frontend with a Node.js and Express.js backend, and MongoDB for data storage.

Keywords: Smart City Management, Civic Issue Reporting, Complaint Management System, MERN Stack, React.js, Node.js, Express.js, MongoDB, JWT Authentication, Role-Based Access Control, Web Application, OpenStreetMap Integration, Real-Time Status Tracking, Admin Dashboard, Field Worker Management, Geolocation Services, RESTful APIs, Urban Infrastructure Management, Civic Complaint Portal, Analytics Dashboard, Full-Stack Development, Digital Governance, Smart Civic Services.

INTRODUCTION

The rapid growth of urban areas and smart city initiatives has increased the need for efficient systems to manage civic infrastructure and public service issues. Traditional civic issue management processes often rely on manual complaint handling, paper-based records, and fragmented communication methods, which are time-consuming and inefficient. Citizens frequently face difficulties in reporting issues such as damaged roads, waste accumulation, drainage blockages, and malfunctioning streetlights, while authorities struggle to track complaints and coordinate field operations effectively. Despite the availability of some digital complaint management platforms, many existing systems provide only basic issue registration functionality without supporting real-time monitoring, worker coordination, or transparent status tracking. Citizens often receive limited updates regarding reported issues, and administrators rely on manual supervision and isolated reports that do not provide complete operational insights. These limitations highlight the need for a centralized and technology-driven civic issue management system.

The Street Care Operation Portal is designed to address these challenges by providing a centralized platform for civic issue reporting, complaint management, and worker coordination. The system integrates modern web technologies with role-based workflows to enable efficient issue handling and operational monitoring. Citizens can report issues by uploading descriptions, images, videos, and live location details, while administrators can monitor system activity, assign tasks to workers, and track issue resolution through interactive dashboards. Field workers can view assigned tasks and update issue status in real time, ensuring transparency and accountability throughout the process.

1.1 Project Description

The Street Care Operation Portal is a web-based civic issue management platform developed to automate issue reporting, complaint handling, worker coordination, and administrative monitoring through a centralized digital system. The system enables citizens to report civic issues such as damaged roads, drainage blockages, waste accumulation, and streetlight failures by uploading descriptions, images, videos, and live location information. Administrators can monitor reported



issues, manage worker accounts, assign tasks, and track overall system activity through an interactive dashboard, while field workers can access assigned tasks and update issue status in real time.

The project consists of both frontend and backend components. The frontend provides user-friendly interfaces for citizens, administrators, and workers, enabling smooth interaction with the platform through role-based dashboards. The backend handles user authentication, issue and complaint management, task assignment, data storage, and status tracking using secure RESTful APIs. To improve operational efficiency and transparency, the system incorporates location-based services, analytical dashboards, and real-time status monitoring to evaluate issue trends, worker performance, and complaint resolution activities.

1.2 Motivation

The primary motivation behind the Street Care Operation Portal is to overcome the limitations of traditional civic complaint management systems that rely on manual processes, paper-based records, and fragmented communication methods. Existing systems often lack centralized monitoring, real-time status tracking, worker coordination, and transparent issue management. As a result, citizens experience delays in issue resolution, while administrators face difficulties in monitoring complaints and managing field operations efficiently. By integrating a centralized web-based platform with role-based access, live location tracking, and real-time status updates, the proposed system aims to reduce manual effort, improve transparency, enhance operational efficiency, and provide a smarter approach for managing civic issues and public service operations.

II. RELATED WORK

Reference	Year	Authors	Methodology	Result	Limitation
Smart Civic Issue Reporting System	2022	V. Varma et al.	Android-based civic issue reporting with image processing and complaint prioritization	Improved complaint registration and issue severity detection	Limited scalability and administrative analytics support
Complaint Management System for Smart City Applications	2021	S. R. Bhosale, P. N. Chatur	Web-based complaint registration and issue tracking system	Faster complaint handling and digital record maintenance	Lacks real-time worker coordination and analytics
Online Public Grievance Redressal System	2020	A. Kumar, R. Singh	Web-based grievance submission and monitoring platform	Improved transparency and complaint tracking	No live location integration or field worker management
GIS-Based Urban Civic Issue Monitoring System	2019	M. Alonso, D. Rivera	GIS and location-based civic issue monitoring	Improved issue identification using geographic data	Limited dashboard analytics and automated workflows
Smart City Complaint Management Using Mobile and Web Technologies	2023	K. Patel, H. Mehta	Mobile and web-based complaint reporting with centralized management	Enhanced communication between citizens and authorities	No advanced analytics or feedback management system

III. METHODOLOGY

The Street Care Operation Portal follows a structured methodology to provide efficient civic issue reporting, complaint management, worker coordination, and real-time operational monitoring.

[1] 1. System Architecture Design

The system is developed using a modular client-server architecture consisting of a React.js frontend for citizens, administrators, and workers, a Node.js with Express.js backend for business logic and API management, and a MongoDB database for secure data storage. The architecture ensures scalability, reliability, and efficient communication between system components.

**[2] 2. User Authentication and Role-Based Access Control**

Secure login functionality is implemented using JWT (JSON Web Token)-based authentication. Role-based access control differentiates permissions among citizens, administrators, and field workers, ensuring that only authorized users can access specific functionalities such as issue management, worker approval, and administrative monitoring.

[3] 3. Civic Issue and Complaint Reporting

Citizens can report civic issues such as road damage, drainage blockages, waste accumulation, and streetlight failures by providing issue details, images, and live location information. The system also allows users to submit complaints against violators by uploading video evidence and geographic location data.

[4] 4. Worker Assignment and Task Management

Administrators review reported issues and assign them to approved field workers based on role and availability. Workers can access assigned tasks, view issue location details, and update issue status as pending, in progress, or resolved through their dashboard.

[5] 5. Real-Time Status Tracking and Feedback Management

The system enables citizens to track the real-time status of reported issues and complaints through their dashboard. After issue resolution, users can provide ratings and feedback, helping administrators evaluate service quality and operational performance.

[6] 6. Location and Mapping Integration

The application integrates OpenStreetMap and geolocation services to capture and display live location data during issue and complaint reporting. This improves issue identification accuracy and helps field workers locate reported problems efficiently.

[7] 7. Security Implementation

Sensitive user data and authentication details are protected using encrypted password storage and secure JWT-based authentication. Server-side validation, protected API routes, and middleware checks are implemented to prevent unauthorized access and ensure secure system operation.

[8] 8. Testing and Validation

The system is tested using unit testing, integration testing, and system testing to verify functional correctness, frontend-backend communication, database operations, and overall application reliability across different devices and browsers.

IV. SYSTEM DESIGN

The system architecture of the Street Care Operation Portal is designed to clearly represent the interaction between citizens, administrators, field workers, core system components, and supporting modules.

At the top level, citizens interact with the system through a web application interface to register, log in, report civic issues, submit complaints against violators, track issue status, and provide feedback after issue resolution. Administrators interact with the system to monitor reported issues and complaints, approve worker accounts, assign tasks to field workers, manage system activities, and analyze operational performance through interactive dashboards. Field workers access the platform to view assigned tasks, check issue location details, and update issue status as pending, in progress, or resolved.

The Street Care Operation Portal acts as the core processing unit, handling authentication, role-based access control, issue and complaint management, task assignment, status tracking, and database communication. The MongoDB database stores all essential data including user details, reported issues, complaints, worker information, feedback records, and system activity logs. Integrated geolocation and mapping services support accurate issue identification and location tracking, improving operational efficiency and coordination between users, administrators, and workers.



Flowchart

Hardware Requirements:

Minimum Configuration:

- **Processor:** Intel Core i5 or equivalent
- **RAM:** 8 GB
- **Storage:** 250 GB HDD/SSD
- **Network:** Stable Internet Connection
- **GPU:** Optional

• **Recommended Configuration:**

- **Processor:** Intel Core i7 / AMD Ryzen 7 or higher
- **RAM:** 16 GB or more
- **Storage:** 500 GB SSD

**Software Requirements:**

- **Operating System:** Windows 10 / Windows 11 / Linux (Ubuntu)
- **Frontend:** React.js with Tailwind CSS
- **Backend:** Node.js with Express.js
- **Database:** MongoDB
- **Authentication:** JSON Web Token (JWT)
- **Mapping Services:** OpenStreetMap / Geolocation APIs
- **Web Browser:** Google Chrome / Mozilla Firefox / Microsoft Edge
- **Development Tools:** Visual Studio Code, Git, Postman

Software testing was conducted through multiple levels to ensure the reliability, security, and performance of the Street Care Operation Portal. Unit testing verified individual functionalities such as user authentication, issue reporting, complaint handling, worker assignment, and status updates. Integration testing confirmed smooth interaction between the React.js frontend, Node.js backend, MongoDB database, and geolocation services. System testing evaluated the complete application across different devices and browsers to ensure responsive design, stable performance, and correct handling of valid and invalid inputs. Finally, end-to-end workflow testing validated the complete flow from user login to issue reporting, worker assignment, issue resolution, and feedback submission, confirming that the application fulfills its intended operational objectives.

UNIT TESTING Unit testing involves verifying individual components of the system independently to ensure correct functionality before integration.

- **Authentication Module** – Login and registration functions for citizens, administrators, and workers were tested separately to ensure proper credential validation, JWT token generation, and rejection of unauthorized access attempts.
- **Issue Reporting Module**– The civic issue reporting functionality was tested using valid and invalid inputs including issue title, description, image upload, and location data to verify correct issue submission and storage.
- **Complaint Management Module**– Complaint submission against violators was tested with video uploads, location information, and incomplete inputs to ensure reliable complaint registration and validation.
- **Worker Assignment Module**– Task assignment functions were tested to confirm that administrators can correctly assign issues to approved workers and update issue status properly.
- **Error Handling and Robustness** – All modules were tested with missing, invalid, or malformed data to ensure the application returns appropriate error messages without system crashes.

INTEGRATION TESTING Integration testing verifies how different modules of the Street Care Operation Portal work together to ensure smooth communication between frontend, backend, database, and supporting services.

- Ensured seamless communication between the React.js frontend, Express.js backend APIs, MongoDB database, and OpenStreetMap geolocation services.
- Validated the complete workflow: User Login → Issue Reporting → Admin Review → Worker Assignment → Issue Resolution → Feedback Submission, ensuring data consistency across all modules.
- Confirmed that role-based access control correctly restricts administrative functionalities such as worker approval, task assignment, and dashboard monitoring from unauthorized users.
- Verified that uploaded images and videos are correctly stored, retrieved, and displayed across user, admin, and worker dashboards.

SYSTEM TESTING System testing ensures the complete Street Care Operation Portal functions reliably and efficiently under real-world operating conditions.

- Tested the end-to-end workflow on multiple devices and browsers to verify responsiveness, stable performance, and proper handling of valid, invalid, and unauthorized access scenarios.
- Validated issue reporting, complaint handling, worker task updates, dashboard analytics, and feedback submission to ensure smooth and consistent user experience across Google Chrome, Mozilla Firefox, and Microsoft Edge.

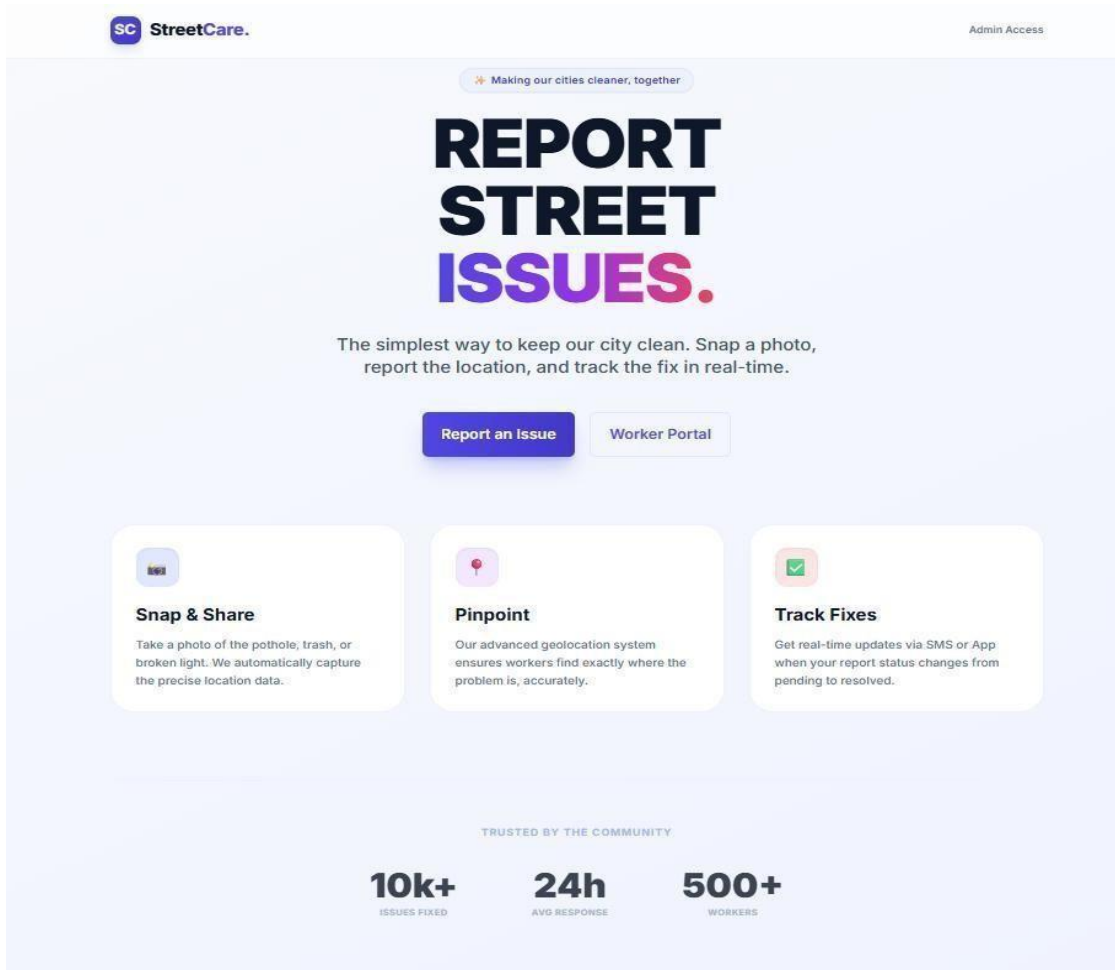


Figure 1: Home page

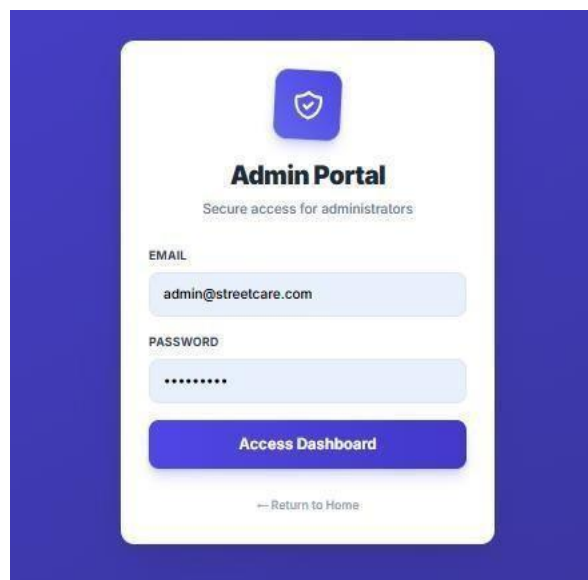


Figure 2: Admin Login

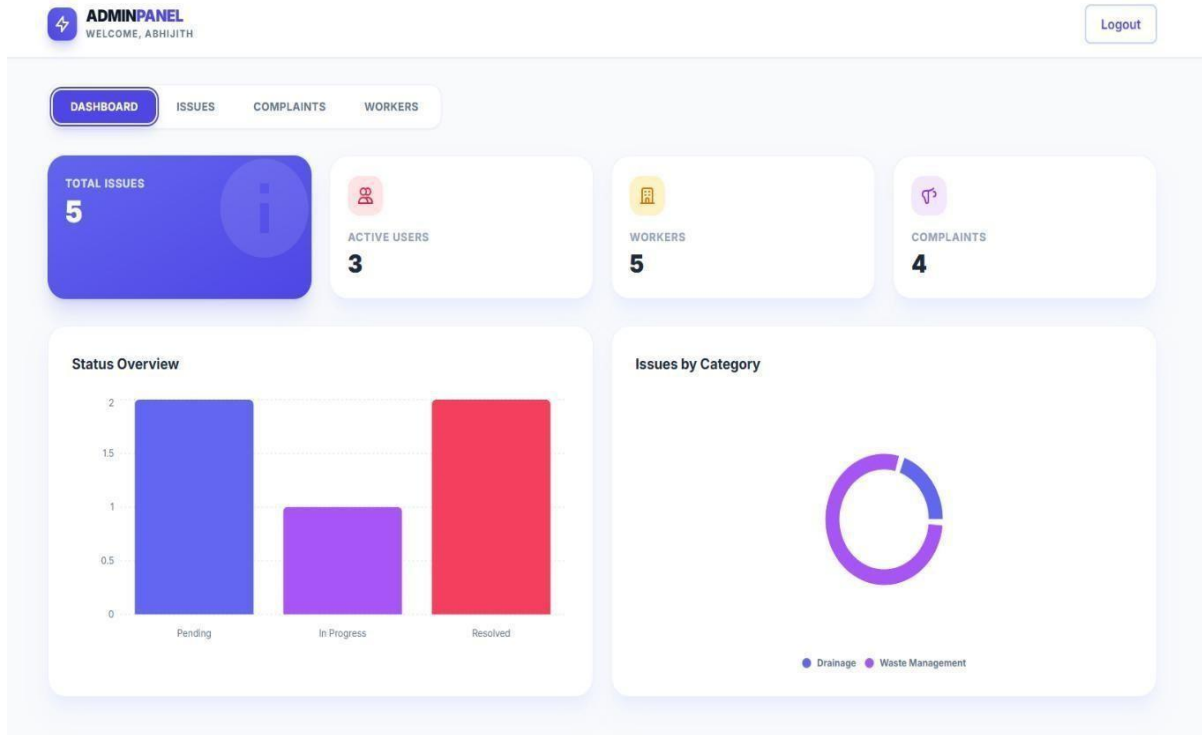


Figure 3: Admin dashboard

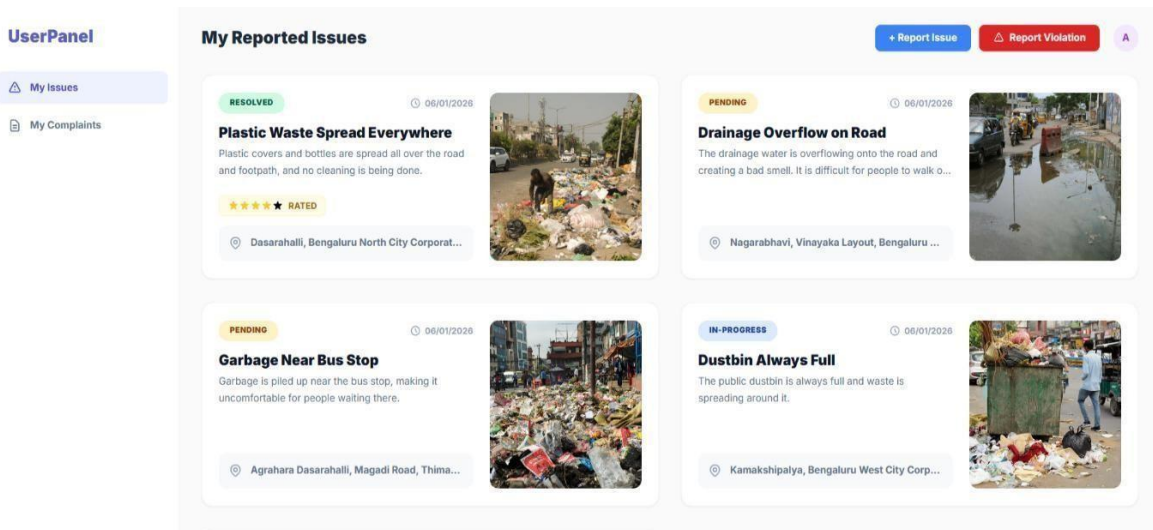


Figure 4: User Dashboard



WORKERPORTAL
RANJITH (ID: EMP003) LOGOUT

TOTAL ASSIGNED 4 **PENDING** 1 **IN PROGRESS** 1 **RESOLVED** 2

ALL (4) PENDING (1) IN-PROGRESS (1) RESOLVED (2)

Plastic Waste Spread Everywhere RESOLVED
Plastic covers and bottles are spread all over the road and footpath, and no cleaning is being done.

WASTE MANAGEMENT

REPORTED BY: Abhishek LOCATION: Dasarahalli, Bengaluru North City Corporation, Bengaluru, Bangalore North, Bengaluru Urban, Karnataka, 560057, India DATE: 06/01/2026

GET DIRECTIONS

USER FEEDBACK
★★★★★ (4/5)
"Good Work"

LAST UPDATE: 06/01/2026 UPDATE STATUS: RESOLVED

Garbage Near Bus Stop PENDING
Garbage is piled up near the bus stop, making it uncomfortable for people waiting there.

WASTE MANAGEMENT

REPORTED BY: Abhishek LOCATION: Agrahara Dasarahalli, Magadi Road, Thimmanahalli, Govindaraj Nagara, Thimmanahalli, Bengaluru West City Corporation, Bengaluru, Bangalore North, Bengaluru Urban, Karnataka, 560040, India DATE: 06/01/2026

GET DIRECTIONS

LAST UPDATE: 06/01/2026 UPDATE STATUS: PENDING

Figure 5: Worker Dashboard

Report Issue
HELP US IMPROVE THE CITY

Issue Details
Please provide detailed information about the issue so we can address it quickly.

Issue Title
e.g. Broken Streetlight on Main St

Category: Roads Upload Image: Choose file...

Description
Describe the issue in detail...

Location
Latitude Longitude Find Me

Address
e.g. 123 Main St, Springfield

Cancel Submit Report

Figure 6: Issue Report page



FILE COMPLAINT
REPORT RULE VIOLATIONS

Details of Violation
Be precise. Your report helps keep our community safe and orderly.

COMPLAINT TITLE
Briefly summarize the violation

DESCRIPTION
Provide full details of the incident...

EVIDENCE (VIDEO)
Choose file No file chosen
* Upload a clear video as evidence (Max 50MB)

Incident Location DETECT LOCATION

Latitude Longitude

Incident Address

Cancel **File Complaint**

Figure 7: Complaint Register page

V. RESULTS AND DISCUSSION

Test Case ID	Description	Input	Expected Output	Actual Output	Result
TC001	Create new user account	Name, Email, Password	Account created and redirected to Login page	Account created and redirected	Pass
TC002	Signup with existing email	Existing Email	Error message displayed	Error message displayed	Pass
TC003	Login with valid user credentials	Valid Email & Password	Redirected to User Dashboard	Redirected correctly	Pass
TC004	Login with invalid credentials	Wrong Password	Error message displayed	Error message displayed	Pass
TC005	Report a new issue	Issue details, image, location	Issue submitted successfully	Issue submitted	Pass
TC006	Submit complaint against violator	Complaint details, video, location	Complaint submitted successfully	Complaint submitted	Pass
TC007	Admin views all reported issues	Admin dashboard access	Issues list displayed	Displayed correctly	Pass
TC008	Admin assigns issue to worker	Assign worker action	Issue assigned to worker	Assigned correctly	Pass
TC009	Admin marks issue as In Progress	Update status action	Issue status updated to Pending / In Progress	Updated correctly	Pass
TC010	Worker marks issue as Completed	Update status action	Issue status updated to Completed	Updated correctly	Pass
TC011	Worker registration request	Worker details	Registration pending admin approval	Status pending	Pass



Test Case ID	Description	Input	Expected Output	Actual Output	Result
TC012	Admin approves worker	Approve worker action	Worker approved successfully	Approved correctly	Pass
TC013	Worker login after approval	Valid worker credentials	Redirected to Worker Dashboard	Redirected correctly	Pass
TC014	Worker views assigned issues	View Assigned Issues	Assigned issues displayed	Displayed correctly	Pass
TC015	Worker views issue location	Click view location	Location displayed on map	Displayed correctly	Pass
TC016	Worker updates issue status	Status update action	Status updated successfully	Updated correctly	Pass
TC017	Admin views analytics dashboard	Open analytics page	Charts and statistics displayed	Displayed correctly	Pass
TC018	User views issue/complaint status	Dashboard view	Updated status displayed	Displayed correctly	Pass
TC019	User submits feedback and rating	Rating and comment	Feedback submitted successfully	Submitted correctly	Pass
TC020	Logout	Click Logout button	Redirect to Login and session cleared	Redirected and session cleared	Pass

VI. CONCLUSION

The rapid growth of urban areas and smart city initiatives has increased the need for efficient systems that improve civic issue management and public service operations. Traditional complaint management systems often rely on manual processes and disconnected communication methods, which reduce efficiency and delay issue resolution. The Street Care Operation Portal was developed to provide a centralized, automated, and user-friendly solution to overcome these limitations.

The proposed system enables citizens to report civic issues and complaints using images, videos, and live location details through a web-based platform. Administrators can manage reported issues, approve workers, assign tasks, and monitor system activity through centralized dashboards. Field workers can access assigned tasks and update issue status in real time, improving transparency and coordination between all users of the system.

The system was developed using the MERN stack to ensure scalability, reliability, and smooth system performance. Integration between the frontend, backend, database, and geolocation services allows efficient data management and real-time communication. Software testing confirmed that the application performs effectively under different usage scenarios, including issue reporting, worker assignment, and status tracking. The Street Care Operation Portal successfully achieves its objective of providing an efficient and intelligent platform for civic issue management and smart city operations.

VII. FUTURE WORK

Although the Street Care Operation Portal successfully fulfills its current objectives, several enhancements can be introduced to improve functionality, intelligence, and scalability. One important future enhancement is the integration of artificial intelligence and machine learning techniques to automatically classify civic issues and prioritize complaints based on severity and location. The system can also be extended with predictive analytics to identify frequently affected areas and help administrators make better operational decisions.

Future versions of the platform may include mobile application support to enable faster issue reporting and real-time notifications for users and workers. Integration of advanced GIS and smart city technologies can further improve location tracking, route optimization, and issue monitoring. Additional features such as multilingual support, cloud-based deployment, and live alert systems can improve accessibility and scalability for large urban environments.



The system can also be enhanced with IoT-based smart sensors for automatic detection of issues such as waste overflow, water leakage, and streetlight failures. Advanced analytics dashboards and AI-powered reporting mechanisms may further support efficient governance and decision-making. These future improvements can transform the Street Care Operation Portal into a more intelligent, scalable, and fully integrated smart city management solution.

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