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JAN SUVIDHA – The Civic Complaint Registering System

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Abstract: Jan Suvidha is a civic-tech mobile application designed to bridge the communication gap between Indian citizens and local municipal authorities. It enables users to report public issues such as potholes, garbage accumulation, and malfunctioning streetlights through a geo-tagged, user-friendly interface. The app fosters real-time issue tracking, improves governmental accountability, and empowers citizens to participate actively in governance. This paper presents the motivation, design process, system architecture, and anticipated social impact of Jan Suvidha

Keywords: Civic Engagement, Public Infrastructure, Geo-tagging, e-Governance, Smart City, Complaint Redressal, Jan Suvidha, Waste Management

I. INTRODUCTION

Urban India faces persistent infrastructure challenges, including **damaged roads** and **inefficient waste management**. Despite the existence of multiple civic bodies, reporting such issues remains tedious due to the lack of integrated communication between citizens and authorities.

Jan Suvidha aims to address this gap through a centralized digital grievance redressal system. Designed as a mobilefirst platform, Jan Suvidha enables users to register location-based complaints with multimedia evidence and track their resolution in real time. By leveraging a dual-user model—citizens and department officers—the app ensures systematic ticket generation and transparent issue resolution workflows.

The platform supports:

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Road Management Complaints (e.g., potholes, broken streetlights, damaged sidewalks)

Waste Management Complaints (e.g., uncleared garbage, overflowing bins, improper segregation)

Jan Suvidha integrates scalable technologies and intuitive design principles to make civic engagement more accessible and effective.

II. LITERATURE REVIEW

E-governance tools have evolved significantly in the last decade. Projects like the Swachh Bharat app, Grievance Redressal Portal (CPGRAMS), and state-level mobile apps have demonstrated the potential of digital tools in enabling public service delivery. However, most platforms face issues such as:

- Fragmented interfaces
- Delayed responses
- Lack of transparency
- Unclear complaint routing

Researchers such as Singh & Rao (2020) have emphasized the role of **geo-tagged evidence** and **status tracking** in improving user satisfaction. Studies have also shown that **department-specific routing**, along with **user feedback loops**, can significantly improve complaint resolution times.

Jan Suvidha builds upon these insights with the aim to provide:

- Simple user experience
- Automated department routing

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- Status-based ticket lifecycle
- Admin dashboards for tracking progress

Key Observations After Testing:

Unlike large-scale portals, Jan Suvidha is **hyperlocal and focused**, targeting critical issues to test depth over breadth in functionality.

i. User authentication and session management were seamless and secure, with role-based access for both citizens and department officers.

ii. The complaint submission and routing flow handled multiple simultaneous reports accurately and without delays.

iii. The database efficiently supported concurrent complaint entries, status updates, and admin actions in real time.

iv. Admin features, such as complaint verification, status management, and user moderation, worked as intended.

Jan Suvidha – Civic Issue Reporting System for Urban Governance

This research presents **Jan Suvidha**, a citizen-centric digital platform designed to modernize local issue reporting and streamline communication between the public and government departments. Built to handle common civic concernstarting with **road infrastructure** and **waste management**. the platform provides a reliable, real-time complaint redressal system that supports transparent status tracking and structured routing.

The application is structured to accommodate scalability, enabling potential expansion into other sectors like water supply, electricity, or public health. At the core of Jan Suvidha lies a **robust backend built using Node.js and Firebase**, ensuring quick data handling, secure authentication, and accurate complaint routing based on issue type and user location.

Jan Suvidha features a **clean and intuitive mobile interface**, developed with Flutter for cross-platform support. This allows citizens to register complaints by selecting issue categories, entering descriptive details, attaching geolocation data, and uploading multimedia evidence such as images. Submissions are processed and assigned to the appropriate administrative department automatically, streamlining bureaucratic handoffs and minimizing delays.

Real-time updates and notification delivery are enabled using **Firebase Cloud Messaging**, while complaint data, user accounts, and administrative logs are stored in a **structured Firebase Realtime Database**, with plans to migrate to a scalable relational database like PostgreSQL as the platform grows.

A web-based **admin dashboard** allows authorized department officers to:

- View and manage complaints by status
- Respond with updates or images
- Assign field agents for resolution
- Generate reports for internal tracking
- Block or flag spam submissions

Security measures such as encrypted authentication and session tracking ensure that the system remains protected and trustworthy. Designed for deployment across multiple administrative zones, Jan Suvidha is **cloud-hosted**, **scalable**, **and modular**, making it suitable for both small municipalities and larger urban bodies.

This paper introduces Jan Suvidha as a **next-generation civic-tech solution**, combining modern mobile technologies, real-time processing, and administrative automation to transform how local infrastructure issues are reported, tracked, and resolved. The platform is not only a tool for redressal but also a step toward building more responsive and accountable governance systems.

III. CONCEPTS AND METHODS

3.1 System Overview

Jan Suvidha operates on a two-sided architecture:

- Citizen Interface (Mobile App)
- Department Officer Portal (Mobile app)

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3.2 Complaint Lifecycle

- **Registration** Users sign in and select a category (road/waste).
- Details Entry Input location, description, and attach photo evidence.
- Ticket Generation Backend assigns a unique complaint ID and routes it to the appropriate department.
- Department Action Officers view and update status: Pending, In Progress, Resolved.
- User Notification Citizens get real-time updates and can rate satisfaction.

3.3 Technologies Used

The Jan Suvidha mobile application is built using a robust and modern technology stack designed to ensure crossplatform compatibility, scalability, and user security.

Frontend (Mobile Application)

Technology: Flutter

Programming Language: Dart

Description: The mobile app is developed using Flutter, enabling seamless cross-platform deployment with native-like performance. It supports rapid UI development and includes Google Maps integration to facilitate geolocation-based complaint reporting. State management is handled using a combination of setState and Provider-based architecture for efficient UI updates.

Backend (Server API)

Technology: Node.js with Express.js

Programming Language: JavaScript

Description: The backend is structured around RESTful API architecture using Node.js and Express.js. It manages core functionalities such as user authentication, complaint submission, and data retrieval. Middleware components are used to enforce security protocols, including JWT-based authentication and role-based access control.

Database

Technology: MongoDB

Description: A NoSQL MongoDB database is employed to store user information, complaints, and session tokens. Its flexible schema design allows dynamic handling of diverse complaint types and real-time status updates.

Authentication and Security

Technologies: JSON Web Tokens (JWT), bcrypt

Description: User sessions are secured using JWT-based authentication along with a refresh token mechanism for prolonged session validity. Passwords are hashed securely using bcrypt to ensure data protection.

Notification System

Technology: Custom backend (Node.js and MongoDB)

Description: A custom-built notification system is integrated using Node.js and MongoDB. Notifications are persisted in a dedicated schema to ensure reliable delivery and historical tracking.

Email Integration (Password Reset)

Technology:Nodemailer with Gmail SMTP

Description: For password recovery, the app utilizes Nodemailer with Gmail's SMTP service to securely send password reset links to registered users.

3.4 Architecture Overview

The system is built on a full-stack architecture using **Flutter (Dart)** for the frontend and **Express.js (Node.js)** for the backend. MongoDB serves as the primary NoSQL database, facilitating scalable and schema-flexible data storage. The mobile app supports two roles—**Citizens** and **Department Officers**—with distinct user flows and dashboard interfaces.

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3.5 Frontend and User Experience

The mobile-first UI is developed in Flutter, ensuring compatibility across Android and iOS devices. Key features include user registration, complaint form submission (with image upload and geolocation), and real-time status tracking. Flutter's built-in widget system and state management tools (e.g., Provider) are used to maintain smooth navigation, form validation, and asynchronous data fetching from the backend.

3.6 Backend API and Middleware

The backend is powered by Express.js and serves as the API gateway between the database and client application. It handles:

- Authentication using JWT tokens for secure, stateless sessions. •
- **Role-based access control**, redirecting users and officers to their respective dashboards.
- **Complaint management**, including status updates, data filtering, and image URL storage.
- Notifications triggered by complaint updates or administrative actions.

3.7 Database Design

DATABASE SCHEMA:

MongoDB stores user accounts, complaint records, verification requests, session tokens, and notification logs. Collections are interconnected using reference IDs to simulate relational behavior in a document-based environment. Timestamps, action flags, and read statuses help track system events and enable efficient query operations.

3.8 Real-Time Features and Scalability

The platform uses polling and optimistic UI updates to simulate real-time status refreshes. The architecture is scalable for additional modules such as water, electricity, and traffic complaints in the future. Role verification, OTP-based phone/email authentication, and secure image handling contribute to system integrity.



IV. ARCHITECTURE

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V. RESULTS

Though still in the prototype stage, Jan Suvidha is expected to:

- Increase citizen reporting by simplifying complaint registration. •
- Improve municipal responsiveness through real-time alerts. •
- Build trust in local governance with transparent progress tracking. •
- Enable authorities to analyze complaint trends and allocate resources efficiently.

Initial user testing indicated high satisfaction with app usability, particularly the geo-tagging feature and real-time status updates

As the app is still in development, direct results are not available. However, expected outcomes include:

- Increased civic engagement, with more citizens reporting issues like road repairs and waste management problems.

- Faster response times from local authorities, leading to quicker problem resolution.
- Improved transparency and accountability in local governance, as citizens can track the progress of their complaints.

- Enhanced public infrastructure and waste management as authorities address issues promptly based on citizen reports.

- Once the app is tested and rolled out, it will provide concrete data to assess its impact on civic engagement and public service delivery.

VI. CONCLUSION

The Jan Suvidha project represents a significant step toward improving civic engagement and public service delivery in India. By providing a simple, user-friendly mobile application, it empowers citizens to report local issues such as waste management, water supply, electricity problems, and road maintenance directly to the relevant government departments.

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Through this research and implementation, we have shown that technology can play a powerful role in bridging the gap between citizens and governance. *Jan Suvidha* is more than just a digital tool; it is a step toward participatory democracy, where every voice can be heard and addressed. With further development and government collaboration, this model has the potential to scale and bring systemic improvements to public service management across the country. In conclusion, *Jan Suvidha* demonstrates how thoughtful civic-tech innovations can contribute to a more responsive, inclusive, and efficient governance ecosystem.

VII. FUTURE WORK

Add More Problem Types – Water, electricity, noise pollution, etc. AI-Based Escalation Engine – Detect unresolved tickets for escalation. Mobile App Localization – Support for Hindi, Marathi, and other languages. Advanced Analytics Dashboard – For officers and citizens.

Integration with Municipal APIs – For direct service handover.

Citizen Engagement Features – Voting on issues, tracking neighborhood problems.

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