

JANMITRA - AI POWERED PLATFORM BRIDGING SOCIETIES WITH NGO'S AND ORGANIZATIONS

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Abstract:

The widening distance between residential communities, Non-Governmental Organizations (NGOs), and government entities sometimes leads to delayed responses and ineffective handling of civic concerns such as waste management, sanitation failures, water leaks, and infrastructure damage. Existing systems need a centralized and intelligent platform for efficient communication and issue resolution. To solve this difficulty, JanMitra is offered as an AI-powered civic engagement platform that unites citizens, societies, NGOs, and authorities into a cohesive digital ecosystem. The technology leverages deep learning-based image recognition to automatically identify and categorise civic concerns from provided photographs, allowing accurate detection of problems such as rubbish buildup, drainage obstruction, and road damage. Based on the categorisation findings, complaints are intelligently directed to certified NGOs for quicker response and resolution. The platform comprises a mobile application for residents, a web dashboard for NGOs and administrators, and a scalable backend system that provides automatic routing, real-time alerts, and data analytics. The suggested method promotes transparency, boosts civic involvement, and enables effective and technology-driven community administration in smart societies.

Keywords:

Artificial Intelligence (AI), Image Recognition, Civic Issue Management, Smart Society, NGO Collaboration, Complaint Routing System, Mobile Application.

I. INTRODUCTION

In the digital age, technology has emerged as a powerful enabler of social transformation and civic development. Residential townships and urban societies frequently face challenges related to waste management, sanitation issues, water leakage, and general community neglect. These problems often remain unresolved or delayed due to the lack of effective communication between society members and Non-Governmental Organizations (NGOs).

Despite the rapid growth of digital communication technologies, there is still an absence of a centralized and user-friendly platform that allows individuals to report civic issues quickly and enables NGOs to respond in an organized and efficient manner. Existing systems often require manual intervention, leading to delays, miscommunication, and reduced transparency in issue resolution.

To overcome these limitations, JanMitra is proposed as a technological innovation that integrates advanced technologies such as Artificial Intelligence (AI) and mobile computing to automate problem detection and strengthen communication between communities and NGOs. The JanMitra application leverages intelligent image-based reporting and digital collaboration tools to create a socially responsible ecosystem where citizens, residential societies, and organizations can work together for effective civic management and community welfare.

II. PROBLEM STATEMENT AND OBJECTIVES

Residential societies frequently encounter a variety of social and civic issues such as improper waste disposal, sanitation failures, water leakage, and infrastructure-related problems. In many cases, these issues remain unresolved not because they are unidentified, but due to the lack of effective communication and coordination among community members, societies, and

Non-Governmental Organizations (NGOs). Citizens often face confusion regarding where and how to register complaints, while NGOs, despite their willingness to assist, may not receive timely or accurate information about local problems.

Existing digital platforms are often complex, non-user-friendly, and lack transparency, resulting in delays in communication and inefficient issue resolution. Therefore, there is a strong need for an intelligent, community-driven system that bridges the gap between citizens, societies, and NGOs through automation, reliability, and real-time collaboration.

The JanMitra platform is proposed to address these challenges by providing an integrated digital solution that enhances communication, simplifies complaint reporting, and improves response efficiency among all stakeholders involved.

Objectives of the Proposed System

The primary objectives of the JanMitra research and development are as follows:

To design and implement an Artificial Intelligence (AI)-based platform capable of automatically identifying civic issues from uploaded images.

To establish a direct connection between verified NGOs and reported complaints to ensure faster and more efficient resolution.

To develop a smart society management module that supports event publication, facility booking (such as clubhouse or swimming pool), and community updates.

To provide real-time status tracking and maintain transparency between users, societies, and NGOs throughout the complaint lifecycle.

To promote active civic participation and strengthen social responsibility through the use of digital technologies and automated workflows.

III. LITERATURE REVIEW

Recent research efforts have focused on developing digital reporting systems that enable citizens to submit complaints using mobile applications, driven by the growing demand for efficient management of community-related concerns. Several studies emphasize that simple and user-friendly interfaces, combined with image-based reporting mechanisms, significantly enhance public participation in community governance. This aligns with the initial workflow of the JanMitra system, where users submit complaints by capturing and uploading photographs of civic issues.

Artificial Intelligence (AI), particularly image recognition techniques, has demonstrated strong potential in identifying and categorizing environmental and civic challenges such as garbage accumulation, infrastructure deterioration, and public safety hazards. Convolutional Neural Networks (CNNs) and modern deep learning architectures have shown high accuracy in automatically detecting and classifying different categories of real-world problems. These technologies form the foundation of intelligent complaint classification systems and support automation in civic issue management.

Trust and transparency remain major challenges in traditional complaint-handling systems. Existing literature highlights that conventional methods are often affected by data manipulation, incomplete records, and delayed responses. To address these limitations, recent studies suggest the integration of blockchain technology to

ensure secure storage of complaint data, providing immutability, traceability, and enhanced public trust.

Another important research area involves the automated distribution of complaints to relevant agencies or NGOs. Studies indicate that intelligent routing mechanisms significantly reduce response time and improve resource utilization by directing issues to the most suitable service providers. This approach enhances operational efficiency and minimizes manual intervention in complaint handling processes.

Furthermore, research on community-driven digital platforms demonstrates that enabling field workers to update complaint status using before-and-after images increases system transparency and improves user satisfaction. Similarly, smart society research highlights the importance of internal community management tools—such as facility booking systems, event notifications, and digital verification modules—in strengthening governance within residential societies.

Finally, notification systems and feedback mechanisms have been widely recognized as essential components for maintaining user engagement and improving communication between citizens and service providers. These systems help establish continuous interaction, reduce response delays, and strengthen trust among stakeholders involved in civic management processes.

IV. SYSTEM ARCHITECTURE

The JanMitra platform adopts a layered and modular system architecture designed to efficiently connect residential societies with relevant Non-Governmental Organizations (NGOs) for effective civic issue resolution. The architecture emphasizes simplicity, scalability, reliability, and automation, while ensuring practical feasibility for real-world implementation and future expansion.

The User Layer consists of a mobile application developed for residents and society administrators. Residents register within a specific residential society using a unique society code or approval-based onboarding mechanism. After successful registration, users can capture and upload images of real-world civic issues such as garbage accumulation, water leakage, open drainage, and sanitation-related problems directly through the mobile interface. Society administrators are provided with additional privileges, including complaint monitoring, approval workflows (if required), and resident management features, enabling centralized control at the society level.

The Core AI Platform functions as the central intelligence unit of the JanMitra system. This layer integrates image-based issue detection, optional text-based analysis, automated complaint categorization, and intelligent NGO routing. Unlike conventional systems that require manual category selection, the platform automatically analyzes uploaded images to determine the nature of the reported issue. This automated approach reduces user effort, minimizes classification errors, and improves the overall efficiency of the complaint submission process.

The NGO Dashboard Layer provides a web-based interface for registered NGOs to manage incoming complaints. Each NGO receives issue reports that correspond to its specific operational domain, such as cleanliness management, water-related services, or environmental support. NGOs can access complaint details, review uploaded images, view associated society information, and update the resolution status. This structured workflow ensures transparency, accountability, and efficient coordination between societies and NGOs.

User profiles, society data, complaint metadata, and picture records must all be securely maintained via the Data and Storage Layer. While picture files are kept in secure object storage to ensure evidence integrity, structured data is kept in a relational database system. In order to improve data security and system dependability, the architecture is also built to accommodate future improvements like government integration dashboards, sophisticated analytics modules, and unchangeable logging systems.

V. AI METHODOLOGY

The core intelligence of the JanMitra system is primarily driven by computer vision techniques, supported by optional Natural Language Processing (NLP) for enhanced contextual understanding. Since the platform follows an image-first reporting approach, the Artificial Intelligence (AI) pipeline is specifically optimized to analyze visual evidence rather than relying extensively on textual descriptions. This design ensures accurate identification of real-world civic issues based on image data captured by users.

The Image Recognition Module utilizes pretrained Convolutional Neural Networks (CNNs) to detect visual patterns associated with common civic problems. These problems include garbage accumulation, overflowing waste bins, stagnant water, drainage blockages, and other sanitation-related issues.

Lightweight pretrained models such as MobileNet are particularly suitable during the prototype stage due to their efficient computational performance, reduced memory requirements, and compatibility with mobile-captured images. This enables faster inference and reliable classification even on resource-constrained systems.

Although image-based input serves as the primary data source, the system also supports an optional Lightweight NLP Module to process short textual descriptions provided by users. Instead of performing complex linguistic processing, the module focuses on intent extraction to assist the image classification process and enhance prediction confidence. This hybrid methodology improves system robustness, especially in cases where image quality is poor or visual information is partially unclear.

After classification, the detected issue is mapped to predefined NGO service categories based on its nature and severity. The system avoids overly detailed predictions beyond its trained dataset to maintain reliability and reduce false-positive outcomes. This AI-driven automation eliminates the need for manual complaint categorization, reduces human error, and significantly accelerates the complaint handling and resolution workflow.

VI. DATA FLOW AND WORKING

The operational workflow of the JanMitra system starts when a registered resident captures and uploads an image of a local civic issue through the mobile application. The image is instantly sent to the backend server along with important metadata such as the society ID, location tag, and timestamp. This first step helps in accurate documentation and ensures proper traceability of the reported issue.

After the image is received, it is processed by the AI-based classification engine, which examines the visual content to identify the type of civic problem. If the user also adds an optional text description, the system uses it to support the image analysis and improve classification accuracy. Based on the predicted issue category, the platform selects the most suitable NGO that can handle the problem.

Once the classification is completed, the complaint is automatically forwarded to the chosen NGO and becomes visible on its web dashboard. At the same time, the complaint is stored in the respective residential society's database so that society administrators can track its status and maintain oversight. The NGO can then acknowledge the complaint, take the required action, and update the complaint status until the issue is resolved.

Both residents and society administrators receive real-time notifications about important updates such as acknowledgment, progress, and final resolution. This closed-loop workflow ensures transparency, accountability, and continuous involvement of all stakeholders. In addition, the structured flow of data improves response efficiency and strengthens coordination between residents, societies, and NGOs.

VII. IMPLEMENTATION DETAILS

The JanMitra prototype is built using a mobile-first approach for residential society users, along with a web-based dashboard specially designed for NGOs and administrative users. The mobile application offers a simple and intuitive interface that helps residents report civic issues quickly and efficiently. Secure login and authentication mechanisms ensure that only verified society members can access the platform and submit complaints, which improves reliability and prevents unauthorized access.

Society onboarding is an important part of the implementation process. Each residential society is registered separately on the platform, and residents can participate only after being successfully linked to their respective society. Society administrators are given higher-level privileges that allow them to manage resident profiles, track complaint activities, view analytics reports, and act as a coordination point between residents and NGOs. This hierarchical structure helps maintain controlled access and smooth society-level operations.

The backend server handles several key functions, such as processing uploaded images, running AI inference tasks, managing complaint routing logic, and sending notification updates. Complaint data is stored in a structured database for easy retrieval and management, while uploaded images are kept in secure storage to preserve data integrity and serve as visual proof of the reported issues.

Overall, the system architecture is designed to be lightweight and resource-efficient while still supporting scalability and future improvements such as advanced analytics, integration modules, and performance optimization features.

VIII. RESULTS AND EVALUATION

Initial testing of the JanMitra prototype indicates a clear reduction in the manual effort required to report and route civic issues. Image-based reporting helps remove ambiguity by providing visual proof, which allows NGOs to understand the problem more clearly and act on accurate information. This improves issue identification and reduces the chances of miscommunication between stakeholders.

Compared with traditional complaint-handling systems, JanMitra enables faster processing and better traceability throughout the complaint lifecycle. Society administrators also gained better visibility into recurring civic issues within their communities, helping them monitor problems more effectively and prioritize resolution. Similarly, NGOs benefited from receiving structured and categorized complaints, which made decision-making easier and improved response speed.

Although the evaluation was conducted in a controlled prototype environment, early user feedback was highly positive because of the platform's ease of use, reduced manual input, and transparent complaint tracking. These results show the strong potential of JanMitra to improve operational efficiency, strengthen communication among stakeholders, and build greater trust in digital civic management systems.

IX. WORK GAPS AND CHALLENGES

Despite its benefits, the JanMitra platform still faces several challenges that require further improvement and optimization. One major issue is the accuracy of image classification, which can be affected by changes in lighting, camera quality, background clutter, and other environmental conditions. To ensure reliable performance in real-world situations, the model needs continuous dataset expansion, retraining, and regular evaluation.

Data privacy and the secure handling of user-uploaded information, especially location-based images, are also important concerns. Strong encryption, secure storage, and limited access controls are necessary to maintain user trust and meet data protection requirements. In addition, NGO response time may vary depending on workload, available resources, and geographic limitations, which are factors beyond the system's direct control.

Scalability is another major challenge, especially when the platform is used across multiple residential societies while maintaining consistent service quality and NGO support. As the number of users and complaints grows, the system must handle higher loads efficiently, support reliable communication, and manage resources properly. Addressing these challenges will be essential for improving scalability, operational efficiency, and real-world deployment.

X. FUTURE SCOPE

The future of the JanMitra platform is aimed at making civic management more effective and improving collaboration among different stakeholders. One major step will be to bring government authorities and NGOs together on the same platform. This kind of hybrid civic resolution system can help multiple service providers work in coordination, improve accountability, speed up decisions, and make public service delivery more efficient.

In the coming stages, the platform may also use more advanced AI techniques to improve detection accuracy and identify a wider range of civic issues. With deep learning models and larger training datasets, the system could become much more reliable and perform better in real-world conditions.

Other possible improvements include multilingual support so that people from different language backgrounds can use the platform easily. Predictive analytics can also help identify repeated community problems early, allowing authorities to act before issues grow bigger. By connecting IoT devices such as smart waste bins and environmental sensors, JanMitra could collect real-time data and monitor civic conditions automatically.

In addition, secure and immutable complaint logging, along with public transparency dashboards, can build trust among users and stakeholders. These features would help protect data integrity, improve accountability, and give everyone clear visibility into how complaints are being resolved.

Overall, these future developments can turn JanMitra into a stronger smart governance platform that supports better urban management and sustainable city growth.

XI. CONCLUSION

The JanMitra platform is a practical and innovative use of AI-driven automation for managing civic issues effectively within residential societies. By combining image-based problem reporting, intelligent complaint classification, automated NGO routing, and society-level monitoring, the system makes the complaint-handling process simpler and more efficient while also encouraging active participation from the community.

Even in its prototype stage, the proposed system shows that AI-based solutions can improve transparency, operational efficiency, and collaboration among citizens, societies, and NGOs. Automated workflows and real-time communication reduce manual effort, avoid unnecessary delays, and make civic management more reliable.

JanMitra also provides a strong technological base for future expansion into large-scale smart governance systems. With further improvements in AI, data analytics, and scalability, the platform can contribute to sustainable urban development, stronger digital governance, and more responsible community management in modern smart societies.



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