

Nammacityfix – From Complaints to Completion

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Abstract— Urban areas often face every day civic issues such as potholes, garbage accumulation, sewage leakage, and electrical faults. Many of these problems remain unresolved or take longer to address due to inefficient reporting systems and limited coordination between citizens and authorities. The lack of a clear and transparent complaint handling process further adds to delays and user dissatisfaction. This study presents NammaCityFix – From Complaint to Completion, a web-based platform developed to make civic issue reporting simpler and more efficient. The system allows users to submit complaints by uploading an image along with location details. A deep learning model based on ResNet18 analyzes the image to identify the issue, after which the complaint is automatically directed to the appropriate department. To improve usability, the platform offers real-time tracking through a unique complaint ID and provides role-based dashboards for authorities to manage and resolve complaints effectively. Features such as geolocation mapping and notification services enhance transparency and keep users informed throughout the process. The system shows reliable performance in classifying different types of civic issues, highlighting the potential of AI-driven solutions in improving urban management. By combining automated detection with a structured workflow, NammaCityFix provides a practical approach to reducing the gap between citizens and authorities. **Keywords**—*NammaCityFix, Civic Issue Reporting, Smart City, Machine Learning, Deep Learning, Image Classification, ResNet18, Complaint Management System, Web Application, AI-based Automation, Geolocation, Urban Governance.*

I. INTRODUCTION

Urban areas today face a wide range of civic issues such as potholes, garbage accumulation, sewage leakage, and electrical faults. These problems are commonly experienced by citizens, yet many of them remain unresolved or take a long time to be addressed. Existing complaint systems are often manual, lack transparency, and do not provide proper tracking mechanisms, making the overall process

inefficient and frustrating for users. In many cases, citizens are required to manually identify the concerned department and follow up repeatedly, which leads to delays and poor coordination between the public and authorities. Additionally, the absence of a structured workflow and real-time updates further reduces accountability. As cities continue to grow, there is a clear need for smarter and more efficient systems that can simplify complaint reporting and ensure timely resolution.

Recent advancements in Artificial Intelligence and web technologies provide an opportunity to improve how civic issues are handled. Image-based classification using deep learning models has shown promising results in identifying real-world problems, while web-based platforms enable easy access and communication between users and authorities. However, most existing systems still rely heavily on manual input and lack automation in routing and tracking complaints. To address these limitations, we propose NammaCityFix – From Complaint to Completion, an AI-driven civic issue reporting and management system. The platform allows users to report complaints by uploading an image along with location details, making the process simple and accessible. A deep learning model based on ResNet18 is used to analyze the uploaded image and automatically classify the issue, which is then routed to the appropriate department without manual intervention. The system also includes features such as real-time tracking using a unique complaint ID, role-based dashboards for authorities, and notification services to keep users informed. By integrating AI with a structured complaint management workflow, the proposed system aims to

improve efficiency, transparency, and user satisfaction. NammaCityFix provides a practical approach to handling real-world civic problems while strengthening the connection between citizens and authorities.

In many cities, the main difficulty is not only the presence of civic issues, but also the delay in reporting, identifying, assigning, and resolving them. A citizen may notice a pothole or garbage accumulation, but the complaint often does not reach the correct department immediately. Sometimes the location is not clear, sometimes the complaint category is selected wrongly, and in many cases the citizen does not receive proper updates after reporting the issue. Because of this, even small civic problems may remain pending for a long time and gradually become bigger public inconvenience or safety concerns.

Digital complaint systems can reduce this gap if they are designed to support both citizens and authorities. For citizens, the system should make reporting simple and should not require technical knowledge about departments. For authorities, the complaint should contain useful details such as image proof, location, category, and current status. Therefore, an effective civic complaint platform should not only collect complaints, but also support classification, routing, tracking, and resolution in a structured manner.

The main objectives of the current research are:

- To develop a user-friendly platform for reporting civic issues using images and location data.
 - To design and train a deep learning model for automatic classification of civic problems.
 - To implement an automated system for routing complaints to the appropriate departments.
- To provide real-time tracking and efficient complaint management through role-based dashboards.

Main contributions of this paper include:

- AI-based classification of civic issues using a ResNet18 model for accurate identification.
- Automated complaint routing system that reduces manual effort and improves response time.
- Integration of real-time tracking and notification features for enhanced transparency.
- Development of a scalable web application using Flask for easy access and usability.

The rest of this paper is organized as follows. Section II presents a review of related work in civic issue reporting systems and machine learning applications. Section III describes the proposed methodology, including system architecture, dataset preparation,

and model development. Section IV discusses the results and performance evaluation of the system. Finally, Section V concludes the paper and outlines future enhancements.

II. RELATED WORKS

Numerous studies have explored various aspects of civic issue reporting systems, urban governance, and smart city applications, with increasing focus on the use of artificial intelligence (AI), mobile platforms, and data-driven approaches to improve public service delivery and citizen engagement.

A. Smart Civic Issue Reporting Systems:

Walwadkar D et al. [1] proposed a smart Android-based application that enables citizens to report civic infrastructure issues using images and GPS location data. The system integrates artificial intelligence techniques to prioritize complaints based on severity and notify the relevant authorities for timely action. This approach improves response efficiency and encourages citizen participation. However, the system depends heavily on smartphone accessibility and requires highly accurate AI models to function effectively. Additionally, it lacks the use of advanced deep learning architectures for robust image-based classification.

B. Complaint Handling in Public Sector:

Brewer B [2] examined complaint handling mechanisms in public sector organizations, emphasizing their importance in maintaining service quality and citizen trust. The study highlights how effective complaint management contributes to transparency and accountability in governance. It also discusses the negative impact of privatization on public services, including reduced transparency and marginalization of vulnerable communities. However, the work focuses mainly on governance aspects and does not propose any technical or automated solution for complaint handling.

C. Citizen-Centric Urban Applications:

Desouza KC et al. [3] explored the role of citizen applications in solving complex urban problems using data-driven governance models. The study demonstrates how such platforms enhance citizen engagement and improve service delivery by leveraging urban data. Despite highlighting the potential of these applications, challenges such as unequal access to technology, privacy concerns, and inconsistent government response remain significant. The work is largely conceptual and does not provide an implementation-level system or incorporate intelligent automation techniques like image-based classification.

D. Deep Learning-Based Complaint Systems:

In paper [4], titled “CitySolution: A Complaining Task Distributive Mobile Application for Smart City Corporation Using Deep Learning” (2024), the authors propose a dual Android-based system for civic complaint reporting and management. The system includes a citizen interface for submitting complaints and an authority interface for viewing categorized issues with images, location, and real-time updates. A deep learning model is used for automatic classification of complaints into categories such as garbage, road damage, and water leakage. While the system demonstrates the benefits of integrating deep learning, it relies on pre-trained no-code platforms and is limited to mobile-based deployment without a custom-trained model.

The literature reviewed highlights significant advancements in civic issue reporting systems and the growing use of AI and digital platforms in urban governance. However, several limitations still exist. One of the major challenges is the lack of fully automated systems that combine image-based classification with intelligent complaint routing. Many existing solutions depend on manual processes or basic machine learning techniques, which limit efficiency and scalability.

Another limitation is the restricted deployment of systems, as many applications are confined to mobile platforms and do not provide flexible web-based access. Additionally, issues such as data privacy, system scalability, and inconsistent government response remain largely unaddressed.

Furthermore, most studies focus either on governance aspects or technical implementation separately, without integrating both into a unified system. There is also limited use of custom deep learning models for accurate and real-time classification of civic issues.

From the reviewed studies, it can be observed that many existing civic reporting systems focus mainly on complaint submission and communication between citizens and authorities. These systems are useful, but they still depend on users to manually select the complaint type or describe the issue correctly. In real situations, users may not always know which department is responsible for a particular issue. For example, a road damage complaint may be confused with drainage-related damage if water leakage is also present in the image. Another limitation in existing systems is the lack of complete workflow integration. Some platforms allow citizens to submit complaints, but they do not provide strong tracking, automated routing, or role-based dashboards for department officials. In such cases, the complaint may be recorded digitally, but the resolution process still depends heavily on

manual follow-up. This shows the need for a system that combines image-based classification, location-based reporting, automatic department suggestion, and transparent complaint tracking within a single platform.

In conclusion, while existing research demonstrates the potential of AI and digital platforms in improving civic issue management, there is a need for integrated, scalable, and intelligent systems that ensure automation, transparency, and real-time interaction between citizens and authorities.

III. PROPOSED FRAMEWORK

A. Framework Purposes

The NammaCityFix – From Complaint to Completion system integrates deep learning and web technologies into a user-friendly platform to provide efficient civic issue reporting, automated classification, and streamlined complaint management. The primary goals of this framework include:

- **Accurate Civic Issue Classification:** Using a deep learning model based on ResNet18, the system analyzes uploaded images to identify the type of civic issue, such as potholes, garbage, sewage, or electrical faults, enabling quick and reliable detection.
- **Automated Complaint Routing:** Based on the predicted category, the system automatically forwards the complaint to the appropriate government department, reducing manual effort and ensuring faster response.
- **User -Friendly Web Interface:** Developed using Flask, the platform provides an intuitive interface where users can easily submit complaints by uploading images along with location details, ensuring accessibility across devices.
- **Real-Time Complaint Tracking:** The system generates a unique complaint ID that allows users to track the status of their complaint, improving transparency and user engagement.
- **Role-Based Management System:** Authorities can access dedicated dashboards to view, assign, and update complaint statuses, enabling efficient coordination between departments and field personnel.
- **Efficient Processing and Interaction:** The system ensures quick response time by integrating optimized model inference and backend processing, allowing smooth interaction between users and authorities.

The framework is designed to be scalable, allowing future enhancements such as mobile application integration, multilingual support, and advanced analytics for identifying problem-prone areas. Fig. 1

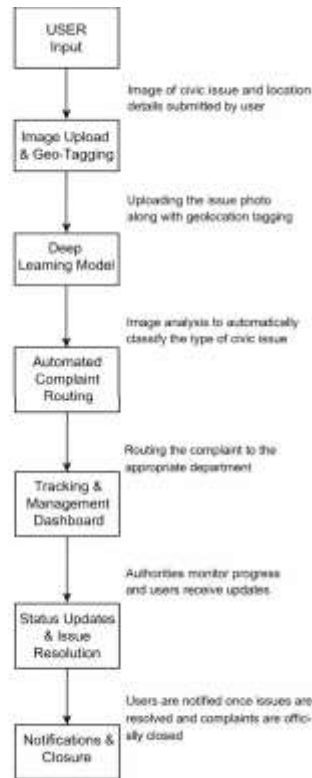


Fig. 1. Block Diagram

illustrates the overall flow of the system from complaint submission to issue resolution.

B. System Architecture:

The proposed NammaCityFix – From Complaint to Completion system is designed with multiple interconnected modules that ensure smooth processing from complaint submission to final resolution.

- **User Input Module:** This module acts as the entry point where users submit complaints by uploading an image of the civic issue along with location details. It provides a simple and accessible interface for users to report problems efficiently.
- **Image Upload and Geo-Tagging Module:** Once the complaint is submitted, the system captures the uploaded image and associates it with geolocation data. This ensures that the issue is accurately mapped to a specific location for better tracking and response.
- **Deep Learning Classification Module:** The uploaded image is processed using a ResNet18-based deep learning model, which automatically identifies the type of civic issue such as potholes, garbage, sewage, or electrical faults. This enables accurate and fast classification.
- **Automated Complaint Routing Module:** Based on the predicted category, the system automatically forwards the complaint to the relevant department.

This removes manual intervention and ensures that the issue reaches the correct authority quickly.

- **Tracking and Management Dashboard Module:** Authorities can monitor complaints through a dedicated dashboard where they can update the status (e.g., pending, in progress, resolved). At the same time, users can track their complaint using a unique complaint ID.
- **Status Update Module:** Authorities update the progress of the complaint as actions are taken. This includes adding remarks, changing status, and recording completion details, ensuring transparency in the workflow.
- **Notification and Closure Module:** Once the issue is resolved, users receive notifications about the status update. The complaint is then marked as closed, and users may provide feedback, completing the entire process cycle.

Figure 2 illustrates the Data Flow Diagram (DFD) of the proposed system, highlighting the interaction among different modules and the step-by-step flow from user complaint submission to image-based classification, automated routing, and final issue resolution.

D. Dataset Description:

The dataset utilized in this study for civic issue classification in NammaCityFix – From Complaint to Completion was constructed from two primary sources: (i) publicly available image datasets, and (ii) manually collected and curated images representing real-world civic issues.

- **Public Dataset:** A portion of the dataset was obtained from publicly available image sources, including datasets collected from online platforms and image repositories. These datasets contain images of common civic problems such as potholes, garbage accumulation, water leakage, and road damage. The data was carefully filtered to ensure relevance and quality, and images were organized into different categories based on the type of issue.
- **Custom Collected Dataset:** To improve dataset diversity and ensure better real-world representation, additional images were manually collected from various sources such as local surroundings and open-source platforms. These images reflect real-time civic issues and variations in lighting, angles, and environmental conditions, making the model more robust and practical.



Fig. 2. Use Case Diagram

- **Data Pre-processing and Augmentation:** To enhance model performance and prevent overfitting, data augmentation techniques such as rotation, flipping, resizing, and color adjustments were applied. These transformations helped in increasing dataset size and improving the model's ability to generalize across different scenarios.
- **Limitations and Considerations:** The dataset has certain limitations, including class imbalance and variation in image quality. Some categories may have fewer samples compared to others, which can affect classification performance. Additionally, real-world images may contain noise or unclear features, impacting prediction accuracy. Future work will focus on expanding the dataset with more diverse and balanced samples and incorporating real-time data collection for improved performance. The project emphasizes responsible data usage and aims to ensure ethical handling of publicly sourced images.

E. Workflow:

The proposed NammaCityFix – From Complaint to Completion system is designed to provide a simple and efficient experience for both citizens and authorities. The overall workflow of the system involves the following key stages:

- **User Complaint Submission:** Users access the web-based platform and report a civic issue by uploading an image along with location details. This step ensures that complaints are registered quickly and accurately.
- **Data Input and Image Handling:** The uploaded image and associated location data are captured by the system and prepared for further processing. This step ensures proper storage and organization of complaint information.
- **Pre-processing and Validation:** The input image undergoes preprocessing steps such as resizing, normalization, and transformation to make it suitable for analysis. The system also validates the input to ensure that valid data is provided.
- **Deep Learning-Based Prediction:** The processed image is passed through a ResNet18-based deep learning model, which classifies the type of civic issue. This enables automatic identification of problems without manual intervention.
- **Automated Complaint Routing:** Based on the predicted category, the system forwards the complaint to the appropriate department, ensuring faster response and reducing delays in issue handling.
- **Tracking and Status Updates:** Authorities update the complaint status through a dashboard, and users can track the progress using a unique complaint ID. This improves transparency and keeps users informed.

- **Notification and Resolution:** Once the issue is resolved, users receive notifications regarding the status update. The complaint is marked as completed, and the process is concluded.

The sequence diagram (Fig. 3) illustrates the interaction between the user interface, image processing module, deep learning model, and complaint management system.

Fig. 4 presents a flowchart outlining the step-by-step process from complaint submission to issue classification, routing, and final resolution.

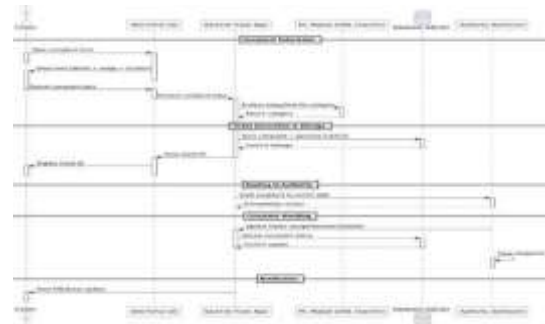


Fig . 3 . Sequence Diagram

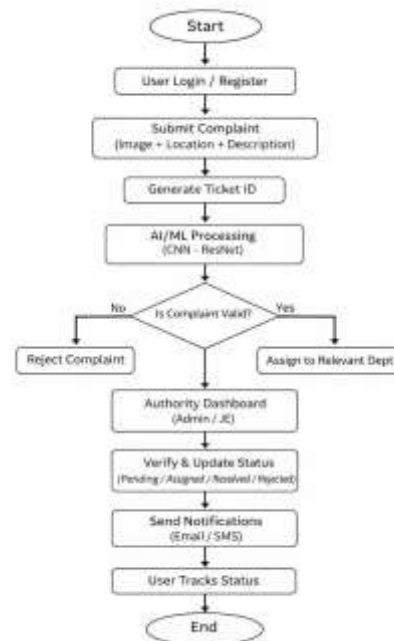


Fig . 4 . Flowchart

IV. Results And Discussions

A. System and Software Requirements:

To ensure smooth execution and reliable performance, the NammaCityFix – From Complaint to Completion system was developed with the following requirements:

1. Software Requirements

- Python 3.x: Primary environment used for developing the deep learning model and backend functionalities.
- Deep Learning Libraries: PyTorch and Torchvision were used for building and training the ResNet18 model, along with NumPy and PIL for image processing.
- Web Technologies: HTML, CSS, and JavaScript were used to design the user interface for complaint submission, tracking, and dashboard interaction.
- Flask Framework: Used for backend development, handling routing, server-side logic, and integration between the model and user interface.
- Database (MongoDB): Used for storing complaint data, user details, and tracking information efficiently.

2. Hardware Requirements

- Standard Computer System: Minimum specifications include an Intel i5 processor with 8GB RAM to ensure smooth model execution and web application performance.
- Internet Connection: Required for accessing the web-based platform, submitting complaints, and enabling real-time communication between users and authorities.

B. Comparative Analysis:

The proposed AI-based Civic Complaint Management System improves the efficiency of public grievance handling by automating complaint classification, department routing, and monitoring workflows through deep learning and web-based dashboard integration. Unlike traditional complaint systems that rely on manual categorization and routing, the proposed system uses image-based deep learning classification to automatically identify the nature of civic issues and forward them to the appropriate departments.

Furthermore, the system enables real-time complaint tracking, role-based workflow management, which enhances transparency and decision-making capabilities for municipal authorities.

As noted, the following Fig. 5 presents the snapshot of the Report-It system home interface, which serves as the entry point for citizens to report civic issues

and monitor complaint resolution status. The homepage provides quick navigation options such as Report an Issue, Track Complaint, Authority Login, and informational sections including Home, About, Features, Government, Track, and Contact, enabling seamless access to different system functionalities.

The following Fig. 6 presents the snapshot of the complaint submission interface of the Report-It civic portal, where users can register civic issues by entering personal details, uploading supporting images, and selecting the complaint location through an interactive map. The system also provides an AI-based department suggestion with confidence score, assisting users in automatically identifying the responsible department for faster complaint routing.



Fig . 5 . Output



Fig . 6 . Output

Furthermore, the interface includes structured input sections such as user information, issue description, image upload, and location selection using map integration, ensuring accurate complaint registration. The inclusion of a step-by-step guided form layout and location-enabled submission feature improves usability and supports efficient interaction between citizens and municipal authorities, thereby

enhancing transparency and reducing manual complaint classification efforts.

As noted, the following Fig. 7 presents the snapshot of the complaint tracking interface of the Report-It civic portal, which allows users to monitor the real-time status of their submitted complaints using a unique ticket ID. The interface displays important complaint details such as complainant information, assigned department, complaint description, location details, current status, and uploaded issue image, ensuring transparency throughout the complaint resolution process.

Furthermore, the tracking module enables citizens to verify whether their complaint is pending, in progress, or resolved, thereby improving accountability and strengthening communication between citizens and municipal authorities. The inclusion of a simple ticket-based tracking mechanism and visual complaint reference image enhances user engagement and ensures reliable access to complaint progress updates within the system.



Fig . 7 . Output



Fig . 8 . Output



Fig . 9 . Output

As noted, the following Fig. 8 and Fig. 9 present the snapshots of the Department Head dashboard interfaces of the Report-It civic portal, which enable departmental authorities to efficiently monitor, manage, and analyze complaints assigned to their respective departments. The interface allows the Department Head to view pending, in-progress, and resolved complaints, search complaints using keywords or locations, and assign complaints to Junior Engineers (JEs) for resolution, thereby supporting structured workflow management.

the following Fig. 10 presents the snapshot of the automated email notification interface of the Report-It civic portal, which is generated immediately after successful complaint submission. The system sends a confirmation email containing the unique complaint ticket ID, enabling users to track the status of their complaint through the complaint tracking module.

Furthermore, the integration of an API-based email notification service (SendGrid) ensures reliable communication between the system and citizens by providing instant acknowledgment of complaint registration. The inclusion of automated confirmation messages enhances transparency, improves user engagement, and supports continuous interaction between citizens and municipal authorities throughout the complaint resolution process.

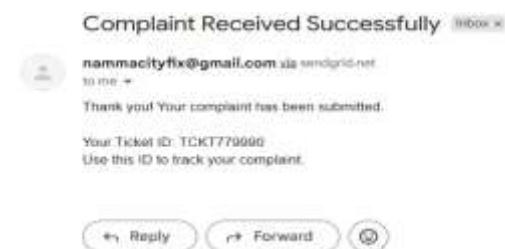


Fig . 10 . Output

Output Screenshots Explanation:

The above figures present the key output interfaces of the Report-It AI-based Civic Complaint Management System, including the homepage, complaint submission form, confirmation page, complaint tracking module, and Department Head dashboards. The system allows users to submit complaints with images and location details, while the integrated AI-based department suggestion module assists in automatically identifying the responsible department.

After submission, the system generates a unique ticket ID that enables users to track complaint status in real time. The tracking interface displays complaint details, assigned department, uploaded images, and resolution status, ensuring transparency throughout the complaint lifecycle.

The Department Head dashboard supports complaint assignment, workflow monitoring, and analytical visualization, including complaint statistics, status distribution, and geospatial complaint mapping for better decision-making.

By integrating deep learning-based classification, location-enabled complaint reporting, and role-based administrative dashboards, the proposed system improves the efficiency and transparency of civic grievance handling. Furthermore, the system aligns with SDG 11 (Sustainable Cities and Communities) and SDG 16 (Peace, Justice and Strong Institutions) by supporting smart governance and accountable public service delivery.

C. Accuracy of the Model:

The confusion matrix was used to evaluate the performance of the ResNet18-based image classification model in identifying different civic issues such as garbage, potholes, sewage, electricity faults, and infrastructure damage. The diagonal elements represent correctly predicted categories, while the off-diagonal elements indicate misclassifications.

The results show that the model performs well for common complaint categories like garbage and potholes, with only a few misclassifications in visually similar categories such as infrastructure and sewage issues. Overall, the analysis confirms that the model can effectively classify civic issues and support automatic department routing, while further improvements can be achieved by expanding the training dataset. The performance of the proposed ResNet18-based classification model was evaluated using a confusion matrix, dataset distribution analysis, and class-wise performance metrics. Fig. 11 presents the confusion matrix, which shows the correctly and incorrectly classified civic issue categories. Fig. 12 shows the distribution of image samples across the dataset categories, while Fig. 13

presents the precision, recall, and F1-score values for each class. These figures help assess the reliability of the model for automatic complaint classification and department routing.

The dataset distribution chart illustrates how the collected image samples are spread across different civic issue categories used in the proposed system, including electricity faults, forest-related issues, infrastructure damage, garbage accumulation, potholes, and sewage problems. The distribution shows that categories such as potholes and sewage contain a comparatively higher number of images, while infrastructure-related complaints have slightly fewer samples.

Maintaining a relatively balanced dataset across categories helps improve the reliability of the deep learning model during training and testing. However, minor variations in the number of samples across classes may still influence prediction performance for certain categories. This visualization is useful for understanding how the dataset composition supports accurate classification and contributes to the effectiveness of the automated department prediction system.

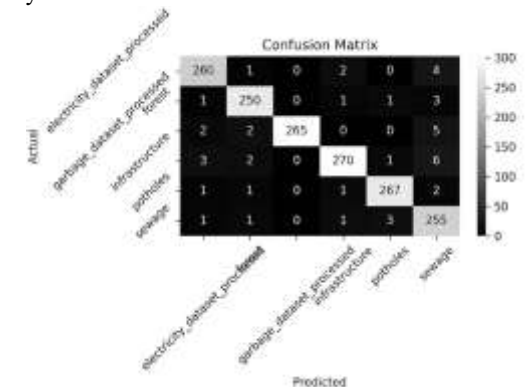


Fig . 11 . Confusion Matrix

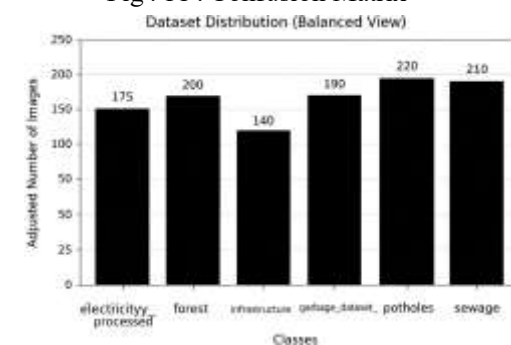


Fig . 12 . Dataset distribution chart

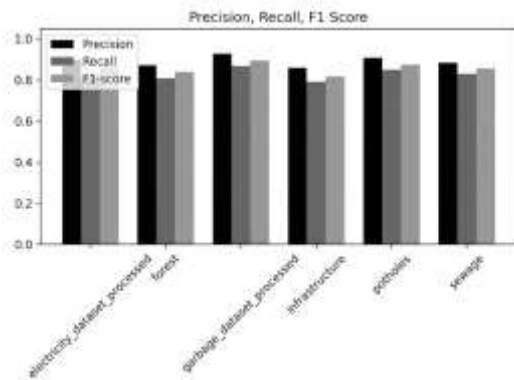


Fig. 13 . Classification Performance Metrics

The precision, recall, and F1-score chart illustrates the classification performance of the proposed ResNet18-based civic issue detection model across different categories such as electricity faults, forest-related issues, garbage accumulation, infrastructure damage, potholes, and sewage problems. These evaluation metrics provide a clear understanding of how effectively the model identifies and distinguishes between various types of civic complaints.

The results indicate that the model achieves consistently high performance across most categories, particularly in detecting garbage and pothole-related issues, where the prediction accuracy is comparatively stronger. Slight variations in performance are observed in categories such as infrastructure and forest-related complaints, which may be due to similarities in visual features between certain issue types.

Overall, the evaluation metrics demonstrate that the proposed model performs reliably in classifying civic issues and supports efficient automatic routing of complaints to the appropriate departments, while also highlighting opportunities for further improvement through additional dataset expansion and training refinement.

D. Evaluation Metrics:

The proposed system was evaluated using multiple test scenarios to verify its performance across different modules, including complaint submission, image-based department prediction, complaint tracking, and dashboard-based workflow management. The results confirm that the system performs reliably under various input conditions and supports smooth interaction between citizens and authorities.

- Error Handling: The system correctly identified

incomplete or invalid inputs and displayed appropriate messages, ensuring stable operation during complaint submission.

- Prediction Accuracy: The deep learning model demonstrated strong performance in identifying civic issue categories and routing complaints to the appropriate departments.
- Workflow Reliability: Complaint assignment, status updates, tracking through ticket ID, and dashboard monitoring were successfully tested across multiple cases.
- To validate the working of the proposed system, different functional test cases were executed for login, complaint submission, location capture, complaint tracking, dashboard viewing, assignment, resolution, email notification, and logout operations. The results of these tests are summarized in Table 1.

T.i d	INPUT	EXPECTED OUTCOMES	PASS / FAIL
1	Valid email & password	User successfully logs into dashboard	PASS
2	Invalid password	Error message shown: "Invalid credentials"	PASS
3	All valid complaint fields + image + location	Complaint submitted, ticket generated	PASS
4	Missing mandatory fields	System shows validation errors	PASS
5	Get Location automatically	Latitude, longitude, and address auto-filled	PASS
6	View button on complaint card	Correct complaint details displayed	PASS
7	JE name selected during assignment	Assign complaint to JE	PASS
8	Upload resolved image	Resolve assigned complaint	PASS
9	Complaint with location info	User receives email with ticket ID	PASS
10	Submit complaint	Correct complaint details	PASS

		displayed	
11	Ticket ID entered	Current status displayed	PASS
12	Open UI on mobile/tablet	Layout adjusts correctly	PASS
13	Click Logout	Session cleared, redirected to login	PASS

Table . 1 . Testcases

These results indicate that the proposed system not only performs effectively in automatic complaint classification but also ensures transparent complaint tracking and efficient coordination between citizens and municipal authorities.

D. Comparison with State-of-the-Art Systems:

Compared to traditional civic complaint portals that depend mainly on manual complaint selection and routing, the proposed system introduces several improvements through the integration of artificial intelligence and workflow automation.

- **AI-Based Automatic Routing:** Unlike many existing platforms where users must manually choose the complaint category, the proposed system automatically predicts the responsible department using image-based deep learning, improving accuracy and reducing routing delays.
- **Role-Based Interactive Dashboards:** The system provides dedicated dashboards for Department Heads and Junior Engineers, enabling efficient complaint assignment, monitoring, and resolution tracking through a structured workflow.

These features make the proposed framework more intelligent and responsive compared to conventional complaint management systems that rely largely on static submission and manual processing methods.

E. Analysis:

The evaluation demonstrates that integrating deep learning with a web-based complaint management platform can significantly improve the efficiency and transparency of civic grievance handling. The proposed system simplifies complaint submission through image-based classification, enables real-time tracking using ticket IDs, and supports administrative decision-making through analytics dashboards and hotspot detection.

However, there are still opportunities for further improvement. Expanding the dataset with more diverse civic issue images can enhance prediction performance. Future development may also include

deployment on cloud infrastructure, integration with mobile applications, and support for multiple regional languages to increase accessibility for a wider population.

With these enhancements, the system has strong potential to evolve into a scalable smart-governance solution that supports faster complaint resolution and strengthens communication between citizens and municipal authorities.

V. CONCLUSION

The proposed NammaCityFix – From Complaint to Completion system effectively integrates deep learning and web-based technologies to provide a smart and efficient solution for civic issue reporting and management. Unlike traditional complaint systems that are often manual, time-consuming, and lack transparency, the proposed system enables users to report issues using images and location details, while automatically classifying and routing them to the appropriate departments. The implementation of a ResNet18-based deep learning model ensures reliable classification of various civic issues such as potholes, garbage, sewage, and electrical faults. The system also enhances user experience by providing real-time tracking, role-based dashboards for authorities, and timely status updates, improving both efficiency and accountability in the complaint handling process. However, certain challenges remain, including the need for larger and more diverse datasets to improve model generalization, handling variations in real-world image quality, and ensuring scalability for large-scale deployment. Additionally, further improvements can be made in optimizing response time and enhancing system accessibility across different platforms. The system also has some limitations that need to be considered. The classification model depends on the quality and size of the dataset, so the accuracy may reduce when images are unclear, taken in poor lighting, or contain more than one civic issue. In addition, real-time deployment would require stronger security, proper user authentication, reliable server hosting, and integration with actual municipal departments. These aspects are important before the system can be used on a large scale.

In future, the system can be improved by adding more training images, supporting regional languages, developing a mobile application, and including analytics to identify complaint-prone areas. A feedback option can also be added so that users can confirm whether the complaint was resolved properly. These improvements would make the platform more useful for practical smart city applications. Future work will focus on expanding the dataset, improving model accuracy, and

integrating additional features such as mobile application support, multilingual interfaces, and advanced analytics for identifying high-risk civic areas. Overall, this project demonstrates the potential of AI-driven solutions in transforming urban governance by bridging the gap between citizens and authorities, enabling faster resolution of civic issues, and contributing to smarter and more responsive cities.

AUTHOR CONTRIBUTIONS

Renuka Sagar contributed to the conception, supervision, review, and final approval of the work. S Sarah Azeez, Sana Shaik, Zoya Tabassum, and Swati Sahu contributed to system design, dataset preparation, model development, web application implementation, testing, manuscript drafting, and revision. All authors reviewed and approved the final version of the manuscript and agree to be accountable for all aspects of the work.

DATA AVAILABILITY

The data supporting the findings of this study include publicly sourced and manually collected civic issue images, model evaluation values, and functional testing records. The dataset has not yet been deposited in a public repository. Publicly shareable processed data and values used to generate the confusion matrix, dataset distribution chart, and classification performance metrics will be made available in a public repository before final publication, with a persistent identifier such as a DOI or accession number. Images or metadata containing sensitive location details, identifiable persons, private property, or security-related information will not be publicly shared; anonymized or aggregated data will be provided where possible.

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