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Intercity Road Complaint Reporter (IRCR)

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Abstract: *The Application for Intercity Road Complaint Reporter Android is an innovative mobile solution designed to monitor and report the condition of road infrastructure in real time. Leveraging Android technology, this application allows users to easily report road hazards, defects, and other maintenance issues, providing a platform for active participation in Intercity Roadmanagement. With features such as GPS tracking, real-time data submission, and multimedia support, users can upload photos, and descriptive reports to help authorities address road issues quickly. The app also offers offline functionality using SQLite for local data storage, ensuring usability in areas with limited connectivity. By streamlining communication between the public, road maintenance agencies, and urban planners, the Intercity Road Complaint Reporter app enhances road safety, improves infrastructure management, and contributes to more efficient allocation of maintenance resources. The Intercity Road Complaint Reporter Android Application has the potential to improve environmental sustainability by enabling authorities to prioritize eco-friendly road maintenance solutions. By tracking the condition of road surfaces in real time, authorities can ensure that repairs are done using sustainable materials or methods, reducing the environmental impact of roadworks. The application also includes user feedback loops systems to keep contributors informed about the status of their reports from acknowledgment to resolution. This transparency builds trust and encourages continued user engagement.*

Keywords: Road Monitoring, Road Complaint Reporter, Android Application, Real-time Reporting, GPS Tracking

I. INTRODUCTION

The condition of road infrastructure plays a critical role in ensuring the safety, efficiency, and sustainability of transportation networks. Poor road conditions can lead to accidents, increased vehicle wear, traffic congestion, and higher maintenance costs. Despite the importance of Road Condition, many areas lack effective systems for monitoring and addressing road-related issues. Roadway infrastructure is susceptible to structural degradation on account of material deterioration primarily caused by heavy traffic, harsh weather conditions, aging, poor construction quality, and lack of appropriate maintenance. Pavement failure can be attributed to diverse factors, such as vehicle loading, environmental conditions, construction quality and maintenance. Vehicle loading and environmental conditions majorly contribute to surface disintegration, resulting in potholes, which become severe as disintegration moves down the layers with time.

To tackle this challenge, the Application for Intercity Road Complaint Reporter Android has been developed to empower citizens, road authorities, and urban planners in monitoring and reporting road conditions. The application serves as an interactive platform for users to report road hazards such as potholes, cracks, or damaged signage, enabling timely intervention by relevant authorities. By leveraging mobile technology, the app enhances communication between the public and road maintenance teams, making it easier to identify and resolve infrastructure problems.

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The application features real-time reporting, GPS-based location tracking, and a user-friendly interface that simplifies the reporting process. Additionally, it includes offline capabilities, allowing users to submit reports even in areas with poor network coverage, with the data syncing once an internet connection is available. This combination of mobile technology, real-time data collection, and community involvement aims to improve road safety, reduce response times, and contribute to the overall betterment of transportation infrastructure. The ability to track the frequency and location of complaints also allows authorities to plan preventive maintenance more efficiently, identifying areas prone to damage and addressing them proactively before minor issues become major road safety concerns.

Moreover, the application offers an opportunity to reduce long-term maintenance costs for governments and road authorities. By allowing users to report problems in real time, the app accelerates the identification of issues that might otherwise have gone undetected until they cause significant damage. For instance, early identification of potholes or cracks can prevent more extensive deterioration, saving on expensive repairs and extending the lifespan of road infrastructure. The ability to track the frequency and location of complaints also allows authorities to plan preventive maintenance more efficiently, identifying areas prone to damage and addressing them proactively before minor issues become major road safety concerns.

As the Intercity Road Complaint Reporter Android Application continues to grow and evolve, there are also opportunities to integrate additional smart technologies, such as Internet of Things (IoT) sensors embedded in road surfaces or vehicles. These sensors could provide real-time data on road conditions and automatically alert authorities when new hazards are detected. By combining crowdsourced data from users with smart infrastructure, the app could create an even more comprehensive and efficient system for Intercity Road Complaint management. In the future, the app could become part of a larger Smart City initiative, contributing to the overall sustainability and resilience of urban infrastructure.

The Intercity Road Complaint Reporter Android Application has the potential to improve environmental sustainability by enabling authorities to prioritize eco-friendly road maintenance solutions. By tracking the condition of road surfaces in real time, authorities can ensure that repairs are done using sustainable materials or methods, reducing the environmental impact of roadworks. The app can also help identify areas with excessive traffic congestion, enabling planners to optimize road use and reduce emissions associated with traffic delays.

II. LITERATURE REVIEW

The rapid urbanization and increasing vehicular movement have necessitated the development of robust and intelligent systems for Road Monitoring Traditional approaches, primarily dependent on manual inspections and governmental bodies like the Public Works Department (PWD), have proven to be time-consuming and often inefficient in responding to road deterioration promptly. The introduction of mobile-based applications, such as Meri Sadak and the PWD-developed Public Complaint Redressal System (PCRS), has enhanced citizen engagement in identifying and reporting road issues, although these systems often lack real-time monitoring capabilities and integration with sensor data for preventive maintenance.

Recent advancements in sensor technologies and mobile computing have opened new avenues for real-time and automated Road Monitoring. Pellegrino et al. [1] in the SMILE project illustrated a multi-sensor mobile device for urban air quality monitoring, demonstrating how mobile platforms could be extended beyond environmental parameters to structural monitoring tasks such as road conditions. Building upon such concepts, road infrastructure monitoring can greatly benefit from portable sensor-based systems embedded within smartphones or attached externally for real-time data collection. Similarly, P. Laclau et al. [2] highlighted how service orchestration in Software-Defined Vehicles can improve automotive user experiences, paving the way for vehicle-based road condition sensing, which can integrate with Android applications for intelligent data dissemination.

The work of Choo et al. [3] used distributed fibre optic sensors with machine learning to classify tool vibrations for Road Monitoring analysis, indicating the feasibility of using sensor-based analytics in portable systems. Xu et al. [4] added that vehicle user behaviour could inform predictive models for mechanical health, which in turn can be adopted for predicting road damage based on vehicular stress patterns. Zhan [5] explored computer vision and deep learning for

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bridge and road structure monitoring, providing critical insights into how these techniques could be adapted to mobile phone cameras for pothole detection or crack analysis via Android apps.

Clustering techniques such as k-means, integrated with rule mining as demonstrated by Sathiyanathan and Warnajith [6], show promise in enhancing road safety analytics, particularly when incorporated within Android-based applications that collect spatiotemporal data. Likewise, Khanafer et al. [7] designed a driver-assistance system which highlights the role of mobile interfaces in contributing to road safety — an area that could be expanded to include health monitoring functionalities. Moreover, Mahajan et al. [8] applied predictive analytics on fatal road crash data in Delhi, emphasizing the significance of location-specific machine learning models. Android platforms can facilitate such models by offering localized data collection and dissemination.

Smart street cleaning vehicles, discussed by Wang et al. [9], showcase how intelligent mobile systems can identify road pollution — a characteristic often associated with road wear. This underlines a broader scope for Android applications in classifying and reporting not just structural defects but environmental cues indicative of road deterioration. Rathore et al. [10] reinforced this perspective by incorporating AI and machine learning into accident analysis, a capability that aligns with Android apps used for public safety alerts and health diagnostics of transportation networks.

Additionally, the design of Android apps for driving assistance, as explained by Gomathi et al. [11], further cements the role of mobile platforms in intelligent transportation systems. These can be leveraged to include modules that notify users about poor road conditions using historical and real-time data. Meanwhile, Muhammad and Koesoema [12] demonstrated that mobile service apps could streamline operations in different domains, a model that could be mirrored for road maintenance coordination between field engineers and local agencies like PWD.

YOLOv7-based road maintenance systems, discussed by Nair et al. [13], exemplify deep learning's efficacy in object detection an architecture that can be incorporated into mobile apps for detecting road anomalies through captured images or live feed. This complements Chen et al.'s [14] research on cloud-enabled infrastructure object recognition, which supports a distributed Android ecosystem connected to centralized municipal systems for comprehensive road monitoring.

Furthermore, wearable environments proposed by Sartori and Melen [20] suggest a future where mobile and wearable systems co-exist to provide continuous environmental sensing. An Android device paired with wearable sensors could serve both drivers and civic authorities in tracking dynamic Road Monitoring data. The inclusion of NLP in user interfaces by Restiani et al. [15] points to another enhancement: voice-based road issue reporting systems via Android, which would particularly benefit less techno-savvy users in remote regions.

From a policy and public interaction standpoint, India's Meri Sadak app empowers citizens to directly report potholes and broken roads to government agencies. However, it lacks automation in detecting or verifying the reported issues. Similarly, the PCRS application by the Public Works Department enables users to log complaints, but both platforms could be vastly improved with AI-based validation, real-time tracking, and integration with IoT sensors and mobile cameras — components easily handled via Android systems.

In terms of construction material and environmental integration, Meghana et al. [17] presented sustainable road construction methods using plastic waste. Android apps could help track degradation patterns of such experimental materials in real-time. Similarly, Suresh et al. [18] explored user location analytics for transport efficiency, a concept transferable to Road Monitoring applications for mapping problem zones based on vehicle behaviour such as sudden deceleration, swerving, or frequent braking.

Smart emergency response systems, such as the IoT-enabled EMS system by Kishore et al. [19], underline the relevance of Android in quick-response applications. If road conditions could be tied into these systems via Android apps, alerts could be dispatched automatically in the event of dangerous road segments being detected. This could also enhance planning of ambulance routes and disaster response mechanisms.

III. METHODOLOGY

The Intercity Road Condition Reporting Android Application operates on a client-server architecture, designed to streamline the process of reporting, managing, and resolving road-related complaints. Upon launching the app, users are presented with a login screen that allows them to choose between User Login or Admin Login. When a user selects

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User Login, they enter their email and password, which are validated by the backend server. Upon successful authentication, they are redirected to the User Dashboard.In this dashboard, the user can upload complaints related to road conditions (such as potholes, broken signals, or traffic issues), check the status of existing complaints (whether they are Pending, In Progress, or Solved), provide feedback about their experiences with the app, or log out. Complaints uploaded by users are initially marked as Pending in the backend and are stored in the database for future status updates and resolution tracking. On the other hand, when an admin logs in by entering a username and password, they are directed to the Admin Dashboard, where they can view comprehensive statistics on complaints, including counts for Pending, In Progress, and Solved cases. The admin dashboard also provides functionalities such as reviewing all complaints, viewing the actions taken on them, handling departmental calls to escalate urgent issues, managing pending complaints, and resolving complaints. Admins can update complaint statuses, assign complaints to the appropriate departments, or mark them as solved. All of these actions are handled and processed by the backend server, which acts as a bridge between the user interface and the database. The backend is responsible for user authentication, complaint management, real-time updates of complaint statuses, and storing feedback submitted by users. The database securely stores data about users, complaints, statuses, and feedback, ensuring the integrity of information. It also tracks changes to the status of complaints and allows the backend to push updates to the user and admin interfaces in real time. This architecture ensures smooth communication between users and administrators, streamlining the process of reporting and managing road health issues, and contributing to quicker resolutions of road-related concerns. Additionally, the application can send push notifications to users, keeping them informed of status updates on their complaints or any important system messages. Overall, this system ensures efficient, secure, and transparent handling of road condition complaints while fostering communication between the public and administrative body.

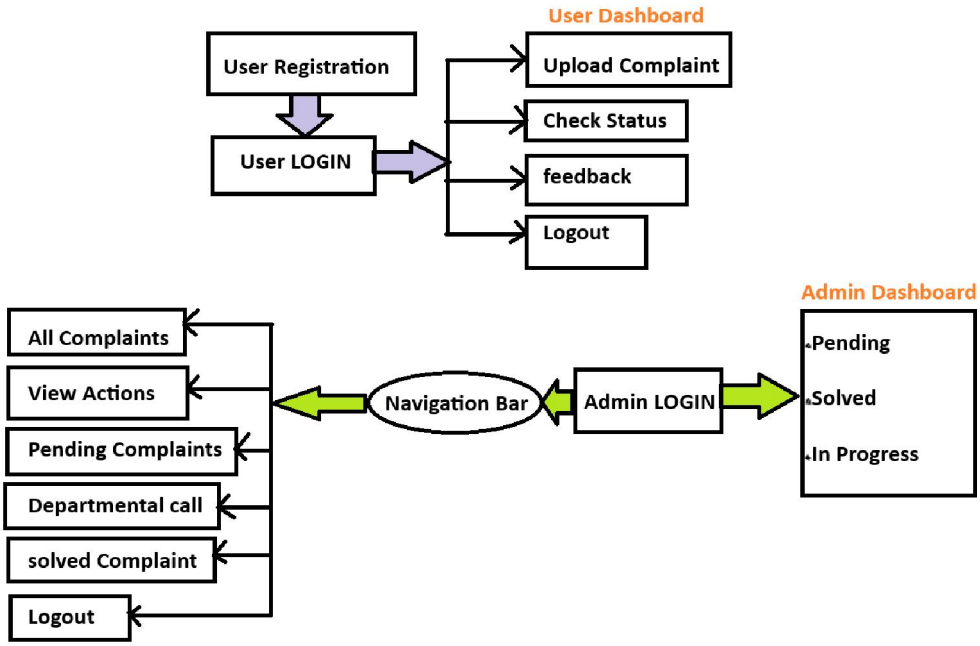

Fig. Shows the architecture of Application for Road Health Android

IV. SYSTEM REQUIREMENT

Hardware Requirements

- **Processor**: Dual-core (1.8 GHz) or higher (recommended: quad-core, 2.5 GHz).
- **RAM**: Minimum 2 GB (recommended: 4 GB or more).
- **Storage**: Minimum 2 GB of free space (recommended: 5 GB or more).

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- **Display**: Minimum 1024x768 resolution (recommended: Full HD 1920x1080).
- **Network**: Broadband connection for online features.
- **Additional Hardware**: Keyboard, mouse, and touchscreen (optional for mobile)

Software Requirement

- **Operating System**: Windows 7/8/10, macOS 10.12 or higher, or Linux (e.g., Ubuntu 18.04).
- **Development Environment**: Java IDE: Eclipse, IntelliJ IDEA, or NetBeans.
- **Android Studio** for XML frontend (if targeting Android).
- **SQLite Browser** for database management.
- **Programming Languages**: Java (backend) and XML (frontend).
- **Database**: SQLite (with the latest SQLite3 version).
- **Libraries**: SQLite JDBC Driver, Gradle/Maven for dependency management.
- **Tools**: JDK (Java 8+), Git for version control.

V. IMPLEMENTATION & RESULT

The Intercity Road Complaint Reporter Android Application is developed using XML for the frontend, Java for the backend, and SQLite for local database management. The frontend, built in XML, defines the app's user interface including layouts for the Login Screen, User Dashboard, and Admin Dashboard. The Login Screen contains EditText fields for email and password along with a Login Button. The User Dashboard includes buttons for uploading complaints, checking status, submitting feedback, and logging out. The Admin Dashboard displays complaint statistics, departmental calls, and management tools. Key UI elements like EditText, Button, TextView, and ListView are used for interaction and display. These UI components are linked to Java code using IDs, enabling smooth user interaction and navigation across the app.

On the backend, Java handles the core logic and user actions. It authenticates login credentials and routes users to the appropriate dashboards. Users can upload road-related complaints, check their status, and give feedback. Admins can view, update, and manage complaints, assign departments, and take necessary actions. Java ensures proper validation and error handling during all processes.

SQLite is employed as the app's database system, offering efficient local storage. It contains tables for users, complaints, and feedback. Using SQLiteOpenHelper, the app manages database creation, upgrades, and interactions. CRUD operations are implemented to create, read, update, and delete data. SQL queries help fetch relevant complaint details, such as filtering based on status. Together, this tech stack ensures a responsive, organized, and user-friendly app experience.

1. Dashboard (Home Page)

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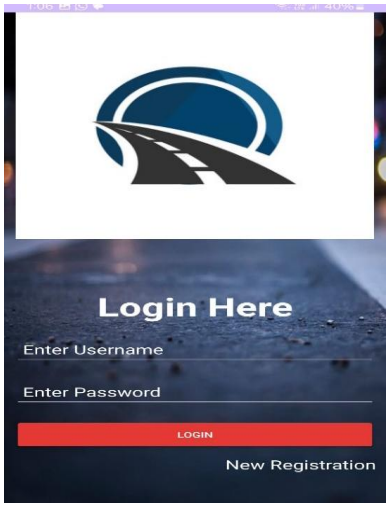
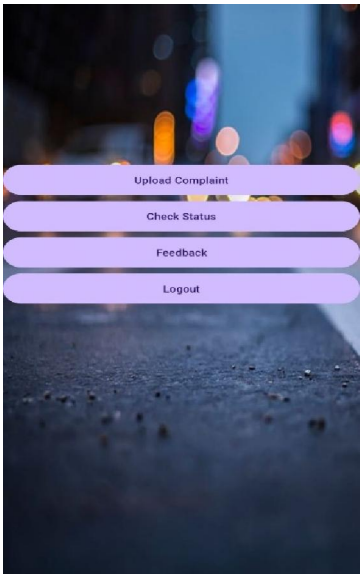
The Login Page serves as the entry point for both users and administrators. It provides two options: User Login and Admin Login. Users are required to enter their email address and password, while admins must provide their username and password. The login process validates the credentials via the backend server. If the authentication is successful, the user is redirected to the respective dashboard. The page is designed with simple input fields and a Login Button, ensuring a user-friendly experience. It also provides options for password recovery or registration if the credentials are forgotten. Security features, such as encryption of passwords, ensure that user data is safely transmitted and stored.

2. User Login



The **User Login Page** allows users to log into the app by entering their **email** and **password**. Upon successful authentication, users are redirected to the **User Dashboard**. If the credentials are incorrect, an error message prompts the user to try again. The page may also include options like **Forgot Password** for resetting the password and **Sign Up** for new users to create an account. Once logged in, users can upload complaints, check complaint statuses, provide feedback, and log out.

3. User Dashboard



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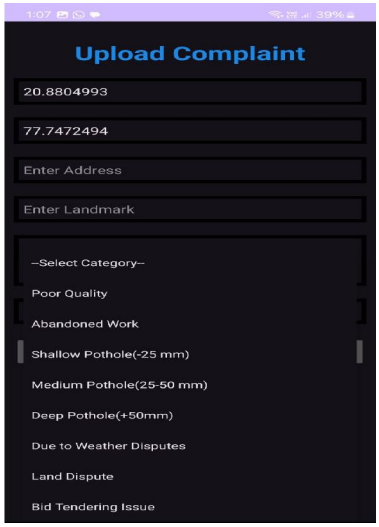
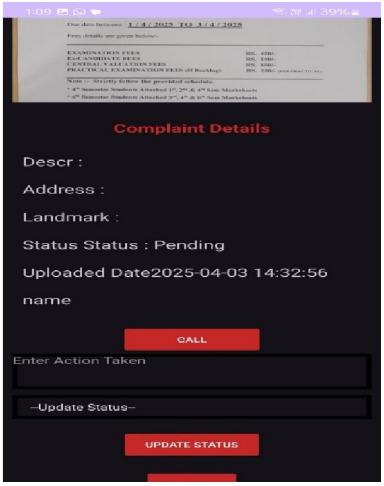
After a successful login, users are directed to the **User Dashboard**, which provides a clean and intuitive interface for interacting with the app. The dashboard allows users to perform various actions, such as uploading complaints about road conditions, checking the status of previously submitted complaints, and providing feedback. The user can easily navigate between different sections via the navigation menu, where they can access options like **Upload Complaint**, **Check Status**, **Submit Feedback**, and **Logout**. The dashboard ensures that users have quick access to essential features, such as viewing the status of complaints marked as Pending, In Progress, or Solved. The overall design is simple, prioritizing functionality and ease of use.

4. Upload Complaint

The **Upload Complaint Page** allows users to report road-related issues such as potholes, broken road signs, or traffic signal malfunctions. On this page, users can enter a detailed description of the issue, specify the location using the GPS feature, and upload relevant images of the problem. The complaint is then stored in the backend database with an initial status of **Pending**. The page is designed to capture all necessary details efficiently, ensuring that the complaint is clear and actionable. Additionally, the page provides instructions on how to upload images and use GPS for precise location tagging, allowing users to contribute to road health monitoring in their area.



5. Check Status



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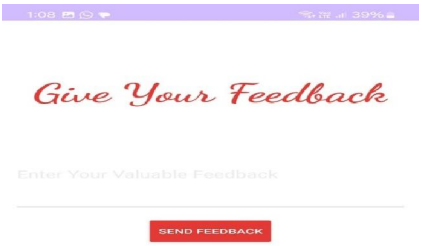
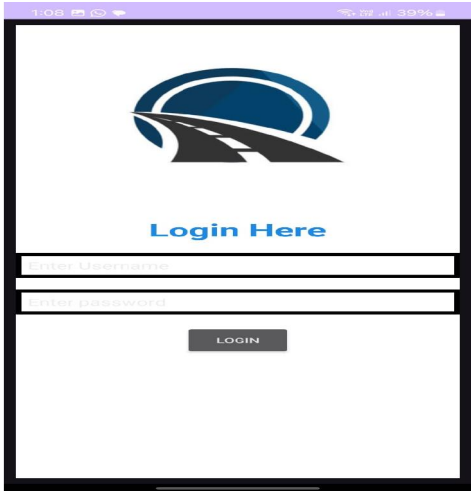
The **Check Status Page** provides users with the ability to track the progress of their complaints. It displays a list of all complaints that have been uploaded by the user, along with their current status (Pending, In Progress, or Solved). Users can filter complaints by status or date, making it easier to track the progress of specific issues. The page is designed to offer transparency, ensuring that users can stay informed about the actions taken on their complaints. The status is updated in real-time via the backend server, so users receive up-to-date information about the resolution process. The user can also view any comments or updates made by the administrators regarding the status of the complaint.

6. Feedback form



The **Feedback Page** allows users to provide feedback about the app or their experience with the road health issue resolution process. Users can submit their opinions on how well their complaints were handled, the effectiveness of the app, or any suggestions for improvement. This page is important for gathering user insights, which can be used for future app enhancements and improving the complaint resolution process. The feedback is stored in the backend database and can be reviewed by administrators. The page includes fields for rating the service and writing detailed comments. Users are encouraged to provide constructive feedback that can improve the overall experience for everyone.

7. Admin Login



The **Admin Login Page** serves as the entry point for administrators to access the admin functionalities of the Road Health Android application. Upon launching the app, the admin selects the **Admin Login** option, where they are

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prompted to enter their **username** and **password**. The credentials are validated against the backend server to ensure that only authorized personnel can access the admin features. If the login credentials are correct, the admin is successfully authenticated and redirected to the **Admin Dashboard**.

If incorrect login credentials are entered, the admin is notified with an error message, prompting them to re-enter the correct information. The login page may also include additional security features such as password recovery options or captcha verification to prevent unauthorized access.

8. Admin Dashboard

The **Admin Dashboard** is the central hub for administrators to manage and monitor road health complaints. After logging in, admins can view statistics on complaints, including counts for Pending, In Progress, and Solved cases. The dashboard provides an overview of the current state of road health issues in the area and allows admins to review all complaints uploaded by users. The admin can click on any specific complaint to see details, including the description, location, and images, and then take appropriate action. Actions available to the admin include assigning the complaint to relevant departments, updating the complaint status, and marking it as resolved. The dashboard is designed to provide quick access to all management tools, ensuring efficient complaint resolution.

9. Update Complaint

On the **UpdateComplaint Page**, administrators can handle specific complaints by viewing detailed reports and taking necessary actions. They can update the status of a complaint, such as changing it from **Pending** to **In Progress** or **Solved**, based on the actions taken by the relevant department. The page also includes a feature for **Departmental Calls**, allowing admins to escalate urgent complaints that need immediate attention. This page serves as the core interface for admins to manage complaints from submission to resolution. It provides easy navigation between different statuses and provides tools to ensure that complaints are resolved efficiently.

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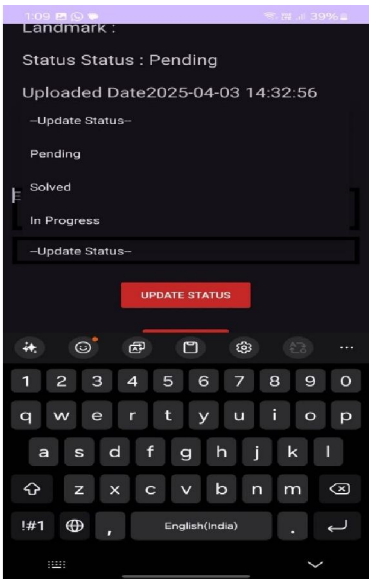
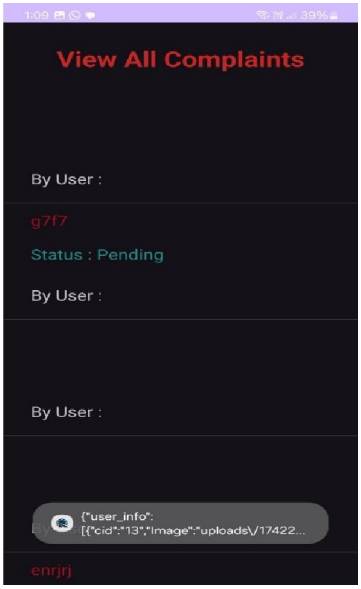


10. View All Complaint



The **View All Complaints** page in the **Admin Dashboard** allows administrators to see a comprehensive list of all user-submitted complaints. It displays key details such as complaint ID, issue type (e.g., pothole, broken signage), status (Pending, In Progress, Solved), and location. Admins can filter and sort complaints by status, date, or severity. Each complaint entry includes an option to view detailed information, including a description, images, and user contact details. Admins can take actions like marking complaints as "In Progress", assigning them to departments, or marking them as "Solved". The page also supports bulk management, allowing the admin to update multiple complaints at once, ensuring efficient resolution and communication.

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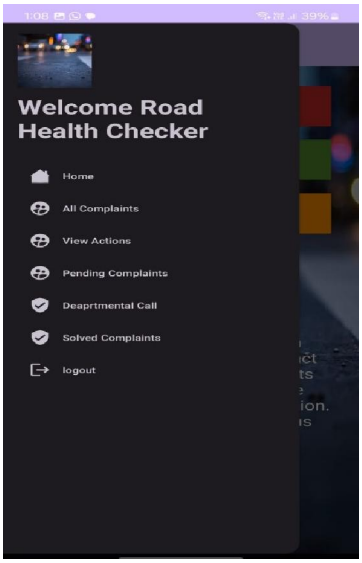
11. Navigation bar



The **Navigation Bar** in the **Admin Dashboard** provides quick access to various sections and functionalities for managing road-related complaints. It is a crucial component that helps admins efficiently navigate through different tasks. Key sections in the navigation bar include:

- **All Complaints**: Directs the admin to a comprehensive list of all user-submitted complaints, where they can view, update, and manage complaint statuses.
- **View Action**: Allows the admin to review actions taken on specific complaints, ensuring transparency and keeping track of resolved issues.
- **Pending Complaints**: Displays complaints that are still unresolved or marked as "Pending", helping the admin prioritize and address critical issues.
- **Departmental Call**: Enables the admin to escalate urgent complaints to the relevant department for immediate attention.
- **Solved Complaints**: Shows complaints that have been resolved, providing an overview of completed actions and completed tasks.
- **Logout**: Provides a secure logout option for the admin to exit the dashboard once their tasks are complete.

12. Upload Image

The **Upload Complaint Page** allows users to report road issues by submitting an image along with a description of the problem. On this page, users can take a photo of the road hazard (e.g., potholes, damaged signage, etc.) directly through the app or choose an image from their device's gallery. The user is also required to provide additional details such as the **location** and a **brief description** of the issue.

Once the image and details are uploaded, the complaint is sent to the backend, where it is stored in the database with a **Pending** status. The user can then track the progress of the complaint through the app. This feature makes it easier for users to report road conditions visually, improving the accuracy and effectiveness of the complaints.

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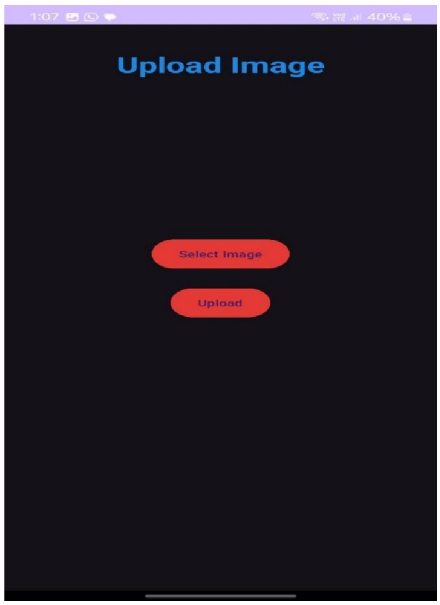

VI. CONCLUSION

The "Road Health" Android application is a forward-thinking solution designed to address the growing challenges of road infrastructure management. By empowering users to actively monitor and report road conditions, the app bridges the gap between citizens and local authorities, fostering a more collaborative approach to road maintenance. Its real-time data collection, detailed reporting features, and GPS integration not only improve the efficiency of identifying hazards such as potholes, cracks, and other road imperfections, but also enable quicker response times from authorities.

Key benefits of the app include the ability to streamline road maintenance efforts, prioritize urgent repairs, and minimize the risk of accidents caused by poor road conditions. Users can report incidents in a simple and intuitive way, using features like image uploads, text descriptions, and precise location tagging. This crowdsourced data can then be analyzed to identify high-risk areas, helping local governments allocate resources effectively.Looking ahead, the app has the potential to integrate with other technologies such as AI for predictive analysis, smart road sensors, and IoT devices, further enhancing its capabilities. By continuously gathering feedback and data from a wide range of users, it could become a crucial tool for long-term urban planning and road health management.

In addition to improving road safety and reducing repair costs, the app also promotes a culture of civic responsibility and awareness, as users become more engaged in the upkeep of their local roads. As road conditions directly impact the quality of life, the Road Health app offers a scalable, cost-effective solution that can be adapted to various regions and governmental bodies worldwide.

Ultimately, the Road Health Android application is not just a tool for reporting road issues—it's a catalyst for smarter, safer, and more sustainable infrastructure management, paving the way for a future where technology and community collaboration work hand in hand to improve public safety and mobility.

VII. FUTURE SCOPE

The future scope of the Road Health Android Application holds immense potential for further enhancing road safety and infrastructure management. In the coming years, the app could incorporate advanced technologies such as Internet of Things (IoT) sensors embedded in road surfaces, enabling real-time monitoring of road conditions. These sensors could automatically detect issues like potholes or cracks and send alerts to both users and administrators, further improving response times. Additionally, integrating machine learning algorithms could help prioritize complaints based on severity, traffic density, or historical data, allowing for more efficient resource allocation by authorities.

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The app could also expand its reach by integrating with other Smart City technologies, offering a more interconnected approach to urban infrastructure management. Collaboration with public safety programs could allow for immediate alerts to emergency services in cases of critical road hazards. Moreover, features like crowdsourced data analysis could be introduced, where users' feedback and reports are analyzed to generate insights on high-risk areas or patterns, helping to prevent accidents proactively. Over time, the app could evolve into a comprehensive platform for community-driven infrastructure improvement, allowing users to track the status of road repairs, request maintenance, and even vote on proposed projects for their neighborhoods.

Furthermore, the app could be expanded to support multi-lingual interfaces to cater to diverse regions and improve accessibility. By integrating cloud-based solutions, the app could offer better scalability and storage management, allowing it to handle large amounts of real-time data and support more users. In summary, as technology advances, the Road Health Android Application has the potential to transform into a robust platform for not only reporting road hazards but also actively contributing to smarter, safer, and more sustainable urban infrastructure.

REFERENCES

[1] J. Pellegrino, H. Aziza, M. Guerin, P. Taranto, W. Rahajandraibe and B. Ravelo, "Development of a Multi-Sensor Mobile Device for Urban Air Quality Monitoring at the Street Corner: The SMILE Project," in IEEE Access, vol. 13, pp. 14857-14871, 2025, doi: 10.1109/ACCESS.2025.3530145.

[2] P. Laclau, S. Bonnet, B. Ducourthial, X. Li and T. Lin, "Enhancing Automotive User Experience With Dynamic Service Orchestration for Software Defined Vehicles," in IEEE Transactions on Intelligent Transportation Systems, vol. 26, no. 1, pp. 824-834, Jan. 2025, doi: 10.1109/TITS.2024.3485487.

[3] K. Y. Choo et al., "Machine Learning-Based Classification of Hand Tool Vibrations Using Distributed Fiber Optic Sensors for Road Health Monitoring," 2024 Multimedia University Engineering Conference (MECON), Cyberjaya, Malaysia, 2024, pp. 1-6, doi: 10.1109/MECON62796.2024.10776462.

[4] Y. Xu, Y. Zhang, W. Yang, C. Xu, F. Wang and H. Yang, "A Battery State of Health Prediction Framework Considering User Behavior for On-road Electric Vehicles," 2024 IEEE Transportation Electrification Conference and Expo (ITEC), Chicago, IL, USA, 2024, pp. 1-6, doi: 10.1109/ITEC60657.2024.10598855.

[5] W. Zhan, "Application and Optimization of Computer Vision and Deep Learning in Road and Bridge Structure Monitoring," 2024 Third International Conference on Distributed Computing and Electrical Circuits and Electronics (ICDCECE), Ballari, India, 2024, pp. 1-6, doi: 10.1109/ICDCECE60827.2024.10549690.

[6] R. Sathiyanathan and N. Warnajith, "Integration of k-Means Clustering and Association Rule Mining for Road Safety Analysis," 2024 International Research Conference on Smart Computing and Systems Engineering (SCSE), Colombo, Sri Lanka, 2024, pp. 1-7, doi: 10.1109/SCSE61872.2024.10550547.

[7] M. Khanafer, F. Khalil, K. Waleed, R. Hamed, A. Rezk and M. El-Abd, "Roads: Road Assistance for Driver Safety," 2024 IEEE Global Conference on Artificial Intelligence and Internet of Things (GCAIoT), Dubai, United Arab Emirates, 2024, pp. 1-6, doi: 10.1109/GCAIoT63427.2024.10833580.

[8] N. Mahajan et al., "Predictive Analysis Through Machine Learning: Fatal Road Crashes in Delhi, India," 2024 International Conference on Intelligent & Innovative Practices in Engineering & Management (IIPEM), Singapore, Singapore, 2024, pp. 1-6, doi: 10.1109/IIPEM62726.2024.10925746.

[9] S. -H. Wang, Y. -X. Liao and L. -X. Zhang, "Intelligent Water-Efficient Street Cleaning Vehicle for Road Pollution Identification Applications," 2024 International Conference on Consumer Electronics - Taiwan (ICCE-Taiwan), Taichung, Taiwan, 2024, pp. 227-228, doi: 10.1109/ICCE-Taiwan62264.2024.10674592.

[10] S. P. S. Rathore, S. P. C, M. Varshney, A. Verma, M. Vashisht and A. Saharan, "AIML for Road Accident Analysis," 2024 4th International Conference on Advancement in Electronics & Communication Engineering (AECE), GHAZIABAD, India, 2024, pp. 261-266, doi: 10.1109/AECE62803.2024.10911307.

[11] N. Gomathi, S. Maddipatla, N. Yadavakunta and G. T. Sree, "Driving Aid Utilizing Android Application," 2023 Innovations in Power and Advanced Computing Technologies (i-PACT), Kuala Lumpur, Malaysia, 2023, pp. 1-6, doi: 10.1109/i-PACT58649.2023.10434426.

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[12] F. Muhammad and A. P. Koesoema, "Design of the Bontocani Health Center Service Application: A Proposed Method," 2023 International Conference on Electrical Engineering and Informatics (ICEEI), Bandung, Indonesia, 2023, pp. 1-5, doi: 10.1109/ICEEI59426.2023.10346677.

[13] K. Nair, P. Jhaveri and R. AppasahebBorgalli, "Road Maintenance System using YOLOV7," 2023 3rd International Conference on Pervasive Computing and Social Networking (ICPCSN), Salem, India, 2023, pp. 1601-1603, doi: 10.1109/ICPCSN58827.2023.00267.

[14] N. Chen et al., "A 5G Cloud Platform and Machine Learning-Based Mobile Automatic Recognition of Transportation Infrastructure Objects," in IEEE Wireless Communications, vol. 30, no. 2, pp. 76-81, April 2023, doi: 10.1109/MWC.002.2200347.

[15] R. Restiani, R. A. H. Winarso, R. W. Berliana, D. D. Rozaan, A. D. Oktavian and S. Arifiani, "Natural Language Processing for Intelligence Assistive Interface Development "LihatIN"," 2023 International Conference on Advanced Mechatronics, Intelligent Manufacture and Industrial Automation (ICAMIMIA), Surabaya, Indonesia, 2023, pp. 1-5, doi: 10.1109/ICAMIMIA60881.2023.10427599.

[16] S. M. Kambare, P. D. Kolpe, S. D. Patil, A. M. Pote, S. S. Patil and P. D. Kokate, "Enhancing Healthcare Delivery in India: Emergency Medical Care and Patient History Management," 2023 International Conference on Advances in Computation, Communication and Information Technology (ICAICCIT), Faridabad, India, 2023, pp. 1099-1104, doi: 10.1109/ICAICCIT60255.2023.10465715.

[17] M. L. Meghana, G. V. Rajya Lakshmi, G. Harika and N. C. Harshit, "Effective Utilization of Plastic Garbage for Road Construction," 2023 9th International Conference on Advanced Computing and Communication Systems (ICACCS), Coimbatore, India, 2023, pp. 226-229, doi: 10.1109/ICACCS57279.2023.10112972.

[18] M. Suresh, S. Saranya, A. Punitha and R. Kowsalya, "Estimation of Bus Arrival by Tracking and Analyzing the Users Real Time Location," 2023 International Conference on System, Computation, Automation and Networking (ICSCAN), PUDUCHERRY, India, 2023, pp. 1-6, doi: 10.1109/ICSCAN58655.2023.10395687.

[19] S. Kishore, S. Sumanth, A. T, H. M. A and S. G, "IoT-Enabled Emergency Medical Service Alert System for Smart Cities," 2023 9th International Conference on Smart Structures and Systems (ICSSS), CHENNAI, India, 2023, pp. 1-5, doi: 10.1109/ICSSS58085.2023.10407705.

[20] F. Sartori and R. Melen, "Design and Implementation of a Platform for Wearable/Mobile Smart Environments," in IEEE Transactions on Engineering Management, vol. 70, no. 2, pp. 755-769, Feb. 2023, doi: 10.1109/TEM.2021.3062786

[21] E. Ranyal, A. Sadhu, and K. Jain, "Road condition monitoring using smart sensing and artificial intelligence: A review," Sensors, vol. 22, no. 8, p. 3044, 2022. doi: 10.3390/s2208304