

## An AI-Powered Web Based Railway Complaint Management System

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### Abstract

The AI-Powered Web-Based Railway Complaint Management System is designed to simplify the complaint process for railway passengers by providing a digital platform to register and track complaints easily. The system supports multiple input methods, including text, voice messages, and image uploads, making it more user-friendly and accessible. Voice-based input helps elderly and visually challenged users, while image uploading allows passengers to provide proof of their complaints. Users can enter important details such as train number, complaint type, and PNR number for accurate processing. Each complaint is assigned a unique complaint ID, enabling users to track its status efficiently. The system uses Natural Language Processing (NLP) to analyze and understand the complaint content. It automatically classifies complaints into different categories based on their type. A priority-based model is used to identify urgent complaints and handle them quickly. This ensures faster and more efficient complaint resolution. Railway authorities can access all complaints through a centralized dashboard. Admins can update the complaint status as Pending, In Progress, or Resolved. The system improves transparency and enhances communication between passengers and authorities. It reduces manual effort and increases efficiency in complaint management. Overall, the project integrates AI and modern web technologies to improve railway service quality and passenger satisfaction.

**Keywords:** AI-Powered System, Railway Complaint Management System, Digital Platform, Voice Messages, Image Uploads, PNR Number, Complaint ID, Natural Language Processing (NLP), Complaint Classification, Priority-Based Model, Centralized Dashboard, Complaint Tracking, Real-Time Status, Passenger Satisfaction, Web Technologies.

### 1. Introduction

Railway transportation is one of the most widely used modes of travel, serving millions of passengers every day. With such a large volume of passengers, various issues such as delays, cleanliness problems, ticketing errors, and service-related complaints frequently arise. Efficient handling of these complaints is essential to ensure passenger satisfaction and improve the overall quality of railway services. Traditional railway complaint management systems often rely on manual processes or basic digital platforms, which may be time-consuming, lack transparency, and provide limited tracking facilities. Passengers may face difficulties in registering complaints, and in many cases, they do not receive timely updates regarding the status of their issues. This results in poor communication between passengers and railway authorities and reduces trust in the system. To address these challenges, this project proposes an AI-Powered Web-Based Railway

Complaint Management System that leverages modern web technologies and artificial intelligence to enhance the complaint handling process. The system provides a user-friendly interface that allows passengers to submit complaints using multiple input methods such as text, voice messages, and image uploads. It also enables users to include important details like train number and PNR number for accurate complaint identification. The proposed system integrates Natural Language Processing (NLP) techniques to analyze and classify complaints automatically based on their content. A priority-based model is used to identify critical issues and ensure that they are addressed promptly. Each complaint is assigned a unique complaint ID, allowing passengers to track the real-time status of their complaints. On the administrative side, the system offers a centralized dashboard for railway authorities to monitor, manage, and resolve

complaints efficiently. By improving transparency, reducing manual effort, and enabling faster response times, the system aims to enhance communication between passengers and railway authorities. Overall, this project demonstrates how the integration of artificial intelligence and web-based technologies can transform traditional complaint management systems into intelligent, efficient, and user-centric platforms, thereby improving railway service quality and passenger satisfaction shown in Figures 1-6.

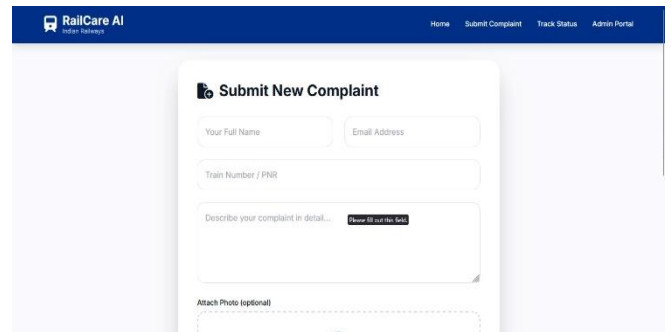
### 2. Methodology

The proposed system follows a structured approach to manage railway complaints efficiently. The methodology includes multiple stages such as complaint submission, processing, classification, and resolution. Initially, the user logs into the system and submits a complaint using text, voice input, or image upload. The system collects important details such as train number, complaint type, and PNR number. This information is stored in the database for further processing. Next, the system applies Natural Language Processing (NLP) techniques to analyze the complaint description. The complaint is automatically classified into categories such as cleanliness, delay, or service issue. After classification, a priority-based model assigns a priority level (high, medium, or low) based on the severity of the complaint. High-priority complaints are handled first to ensure quick resolution. The complaint is then forwarded to the admin dashboard, where railway authorities can review and update the complaint status. Users can track their complaints using a unique complaint ID. This methodology ensures efficient complaint handling, reduces manual effort, and improves overall system performance.

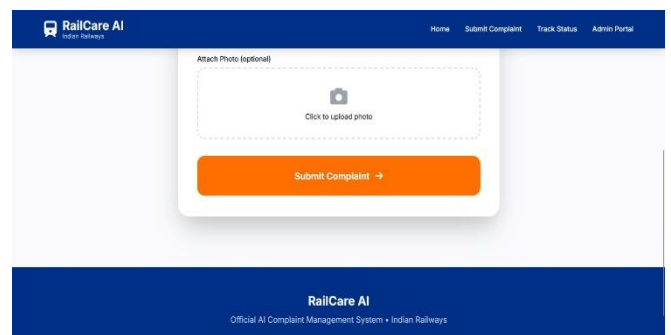
### 3. Figures



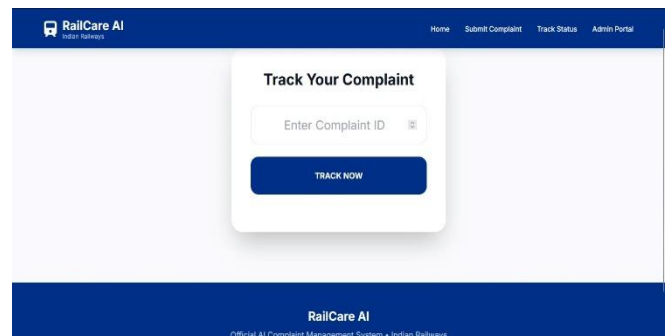
**Figure 1 Home Page: Main interface providing access to railway complaint services.**



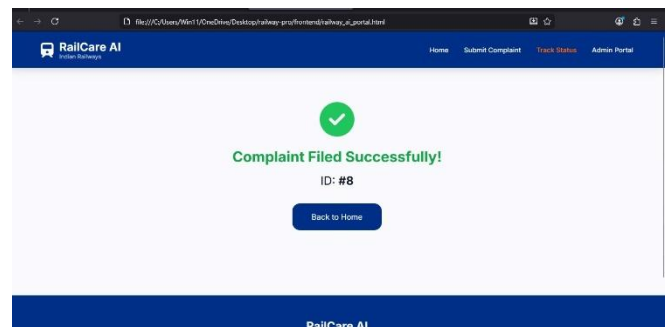
**Figure 2 Complaint Submission Page: Form used by passengers to register complaints.**



**Figure 3 Image Upload Feature for Submitting Issue Evidence**



**Figure 4 Complaint Tracking Page: Interface to check the status of submitted complaints.**



**Figure 5 Admin Portal: Dashboard for administrators to review and manage complaints.**

## 4. Results and Discussion

### 4.1. Results

The system was successfully developed and tested, allowing users to submit complaints through text, voice, and image inputs [1-3]. The AI model accurately classifies complaints and assigns priority levels for efficient handling. The backend and admin dashboard enable real-time tracking and quick status updates. Overall, the system improves complaint management efficiency, reduces response time, and enhances user satisfaction.

### 4.2. Discussion

The proposed system architecture ensures smooth communication between all components, including the user interface, backend server, AI model, and admin panel. Users can easily submit complaints through text, voice, or image inputs, which are processed by the backend using REST APIs. The integration of the AI model with Natural Language Processing (NLP) enables automatic classification of complaints, reducing manual effort and improving accuracy. Furthermore, the priority-based model helps in identifying urgent complaints and ensures faster resolution. The admin dashboard provides a centralized platform for authorities to monitor and manage complaints efficiently. This system improves transparency, enables real-time tracking, and enhances communication between passengers and railway authorities, making the overall complaint management process more effective and scalable.



**Figure 6** System Configuration

## Conclusion

The AI-Powered Web-Based Railway Complaint Management System provides an effective solution for managing railway complaints. It simplifies the complaint process and enhances communication between passengers and railway authorities. The integration of AI techniques such as NLP and priority-based classification improves the efficiency of complaint handling. The system ensures faster response times and better service quality. This project demonstrates the potential of combining AI and web technologies to develop smart and user-friendly public service systems.

## Acknowledgements

The authors would like to express their sincere gratitude to Dr. S. Balaji, Professor, Department of Artificial Intelligence and Data Science, Kamaraj College of Engineering and Technology, for his valuable guidance, support, and encouragement throughout the development of this project. We also thank the faculty members of the department for their continuous support and suggestions. Finally, we express our gratitude to our institution for providing the necessary resources and environment to successfully complete this work.

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