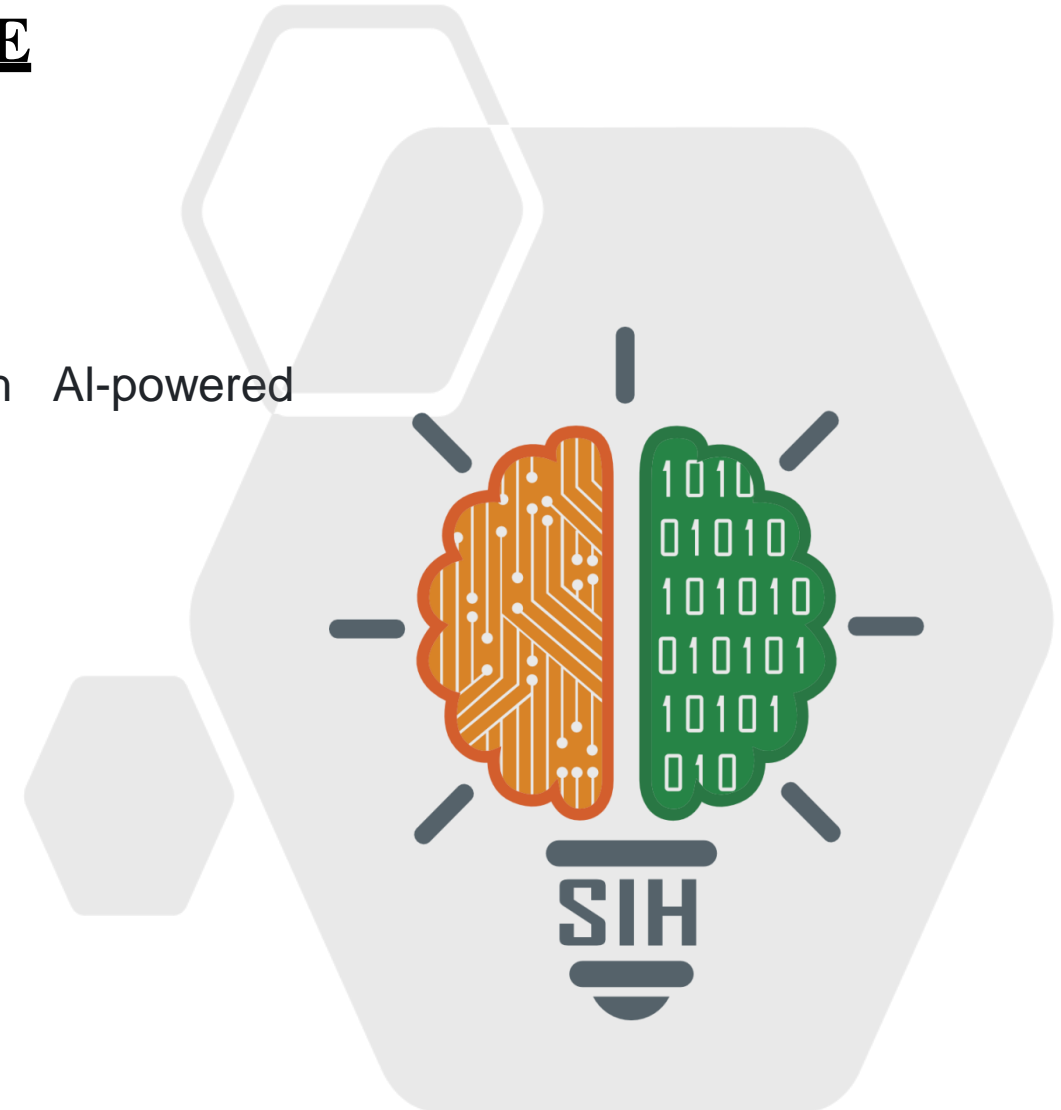


SMART INDIA HACKATHON 2024



TITLE PAGE

- **Problem Statement ID** - SIH1711
- **Problem Statement Title** - Enhancing Rail Madad with AI-powered Complaint Management
- **Theme** - Smart Automation
- **PS Category** - Software
- **Team ID** – 33281
- **Team Name** - BUGS DENIED



➡ Problems Faced :

- Current Rail Madad heavily relies on manual processing.
- Late responses and chances of unattended complaints.
- No SOS is implemented.
- No help desk.

➡ Proposed Solution :

- Rail Madad with **AI-powered complaint management** for enhanced efficiency.
- **Automated categorization and routing of complaints** using AI to relevant departments.
- **Urgency detection** from visual content.
- AI chatbots for immediate confirmation and gathering of information.
- Implementing **SOS** system for medical emergencies and safety concerns.

➡ Unique Value Proposition :

- The grievance description will also be used by the **Natural Language Processing model**. In case of conflict between text and image, **visual information will be prioritized**.
- **Offline SOS system** for the safety of the passenger's traveling

Algorithm Development :

Step-1: UI Image Loading : Image upload and processing.

Step-2: Convolutional Neural Network (CNN) based image classifier and the uploaded image classifies into
Label 0:Violence
Label 1:Washroom
Label 2:Coaches

Step-3: AI driven **Image feature classification** by the CNN model.

Step-4: Next step after classification, complain categorization.

Step-5: Assigns **responsibility** to responsible party.

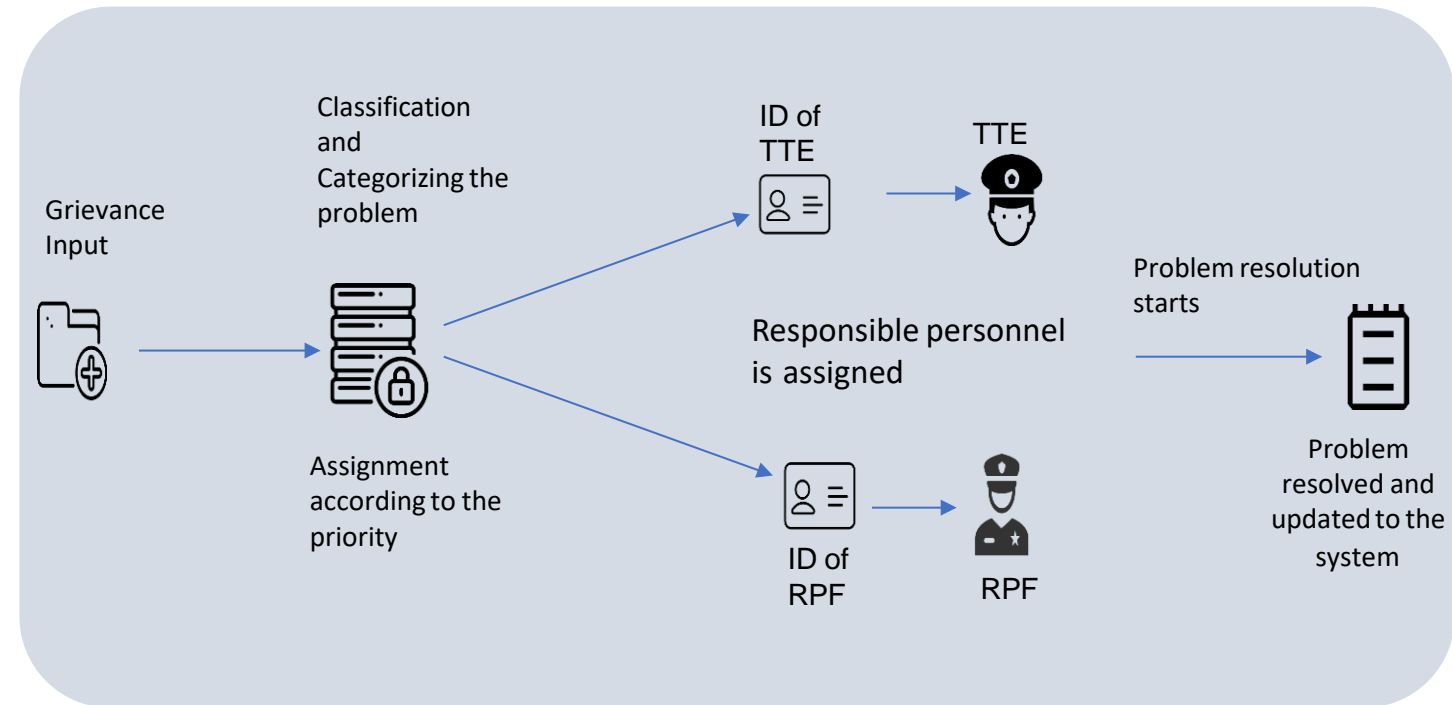
Step-6: PNR-Based Person Identification: **Confirms and verifies PNR details.**

Step-7: Assigns responsible personnel, based on PNR.

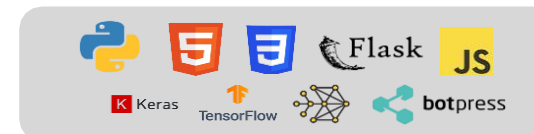
Step-8: The responsible person's details (ID) are sent back to the system. - Displays next step and information of responsible party.

Step-9: Final Render and Notification: Communicates with responsible party and begins resolution.

Flow Chart :



Technologies used :



Product Status : 65% Completed.

➡ Feasibility and Viability :

- The AI solution can be **integrated into Rail Madad's current infrastructure** using **API** and **cloud based services** to ensure smooth transition.
- Seamless integration of AI-powered complaint **management without any disruptions** and **maximizing benefits of AI-driven processes.**
- Using Complaint data for AI training.
- Adaptable systems with AI, allowing it to **evolve and meet future challenges and requirements.**
- Our Robust System is highly cost Efficient because of it being **Open Source.**

➡ Challenges & Risks :

- **Availability** of Dataset to train the model.
- **Loading of DOM(document object model)** in low network area.
- **Emergency help allocation** during accidents/calamities.
- Fake complaints /pranks.
- Wi-Fi access for important portals.

➡ Strategies :

- Manually clicking the photos and getting the data from the **Officials.**
- Making the **interface easy and seamless.**
- Training train staff **basic first aid** and **CPR.**
- A **severe action** will be taken for **fake alerts.**
- Enabling the basic platform requirements.

➡ Impacts:

- **Process resolution complaint :** AI eliminates manual intervention. Makes the workflow entirely digital-image recognition right up to resolution assignment.
- **Speed processing and routing:** Complaints are processed and routed in real time to the concerned department.
- **Resource-sensitive AI-based resource allocation:** This kind of work allocation with concern for available resources and their priorities is called AI – based work allocation.
- **Reductive Maintenance:** The system, based on predictive failures such as faulty components or scheduled maintenance, will avoid major breakdowns and provide greater service integrity.
- **No Dropped Complaints:** it makes sure that complaints will not be dropped; it strengthens the chain of accountability between departments. This can impact strongly on raising the reliability of service and the trust built among customers.
- **SOS System:** The offline SOS system will make travel more safer for Women.

➡ Benefits :

- **Resolution of grievance:** It provides a faster mean time of saving 40 percent time with maximum productivity and satisfaction
- **Cost reduction:** Predictive maintenance reduces the likelihood of performing emergency repairs, thereby reducing maintenance by 15-20%.
- **Instant feedback:** AI enables services that have transparency, which implies it helps increase the customer satisfaction and confidence levels by 40-50%
- **Critical Grievance handling:** Reduced to 50 percent both in safety as well as the response to critical issues
- **Accurate Classification:** AI improves complaint accuracy up to 30%-50% through image based analysis

SL.no	Title/Description/Year of Publication	Author/Publisher	Contribution	Limitation
1	An Analysis Of Convolutional Neural Networks For Image Classification. (2008)	Neha Sharma,Vibhor Jain, Anju Mishra	<ul style="list-style-type: none"> Comparison of different CNN architectures for image classification. Evaluation of performance metrics and optimization techniques for CNNs. 	<ul style="list-style-type: none"> Limited performance on small datasets. Vulnerable to adversarial attacks.
2	Deep Learning Model of Image Classification Using Machine Learning. (2022)	Qing Lv, Suzhen Zhang, Yuechun Wang	<ul style="list-style-type: none"> Proposed a deep learning model for image classification Optimized the model to improve efficiency and accuracy 	<ul style="list-style-type: none"> Traditional neural networks had low efficiency and accuracy. Existing models needed noise reduction and parameter adjustment for improvement.
3	Problem of Indian Railway Management System. (2019)	Sayan Sarkar	<ul style="list-style-type: none"> Railway connects different regions of the country and plays a crucial role in economic development. Indian government has taken important measures for railway infrastructure development. 	<ul style="list-style-type: none"> Rampant corruption, lack of trains, strikes, equipment failures Shortage of stations, lines, low capacity utilization, ticket system issues
4	Flask Decoded: Your Gateway to Deploying ML Models Effortlessly. (2023)	Reza Shokar zad	<ul style="list-style-type: none"> Integrating machine learning model into existing business software. Model deployment for batch or real-time predictions. 	<ul style="list-style-type: none"> No support for virtual debugging, less flexible, tough learning curve. Not suitable for small projects, slower than Flask, monolithic platform.
5	Keras and TensorFlow: A Hands-On Experience. (2021)	Ferdin Joe John Joseph, Annop Monsakul	<ul style="list-style-type: none"> Theoretical and practical aspects of Keras and TensorFlow explained. Architectures of TensorFlow and Keras simplified for easier understanding. 	<ul style="list-style-type: none"> Decision trees' sensitivity to changes in coordinate system Limited training data and poor data quality mentioned as challenges