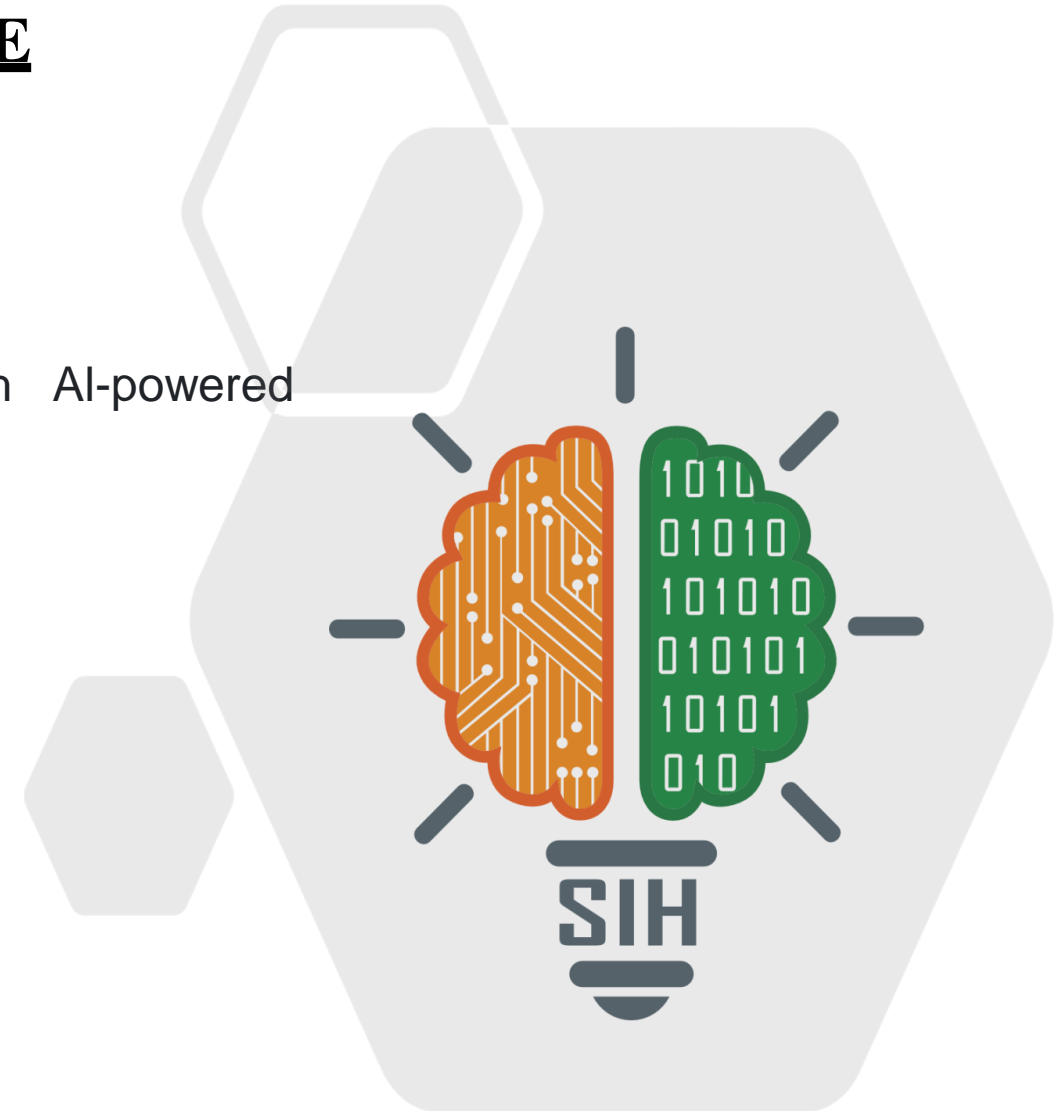# SMART INDIA HACKATHON 2024

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

IDEA TITLE

SMART INDIA HACKATHON 2024

➡ 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

BUGS DENIED

TECHNICAL APPROACH

SMART INDIA
HACKATHON
2024
SIH

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.

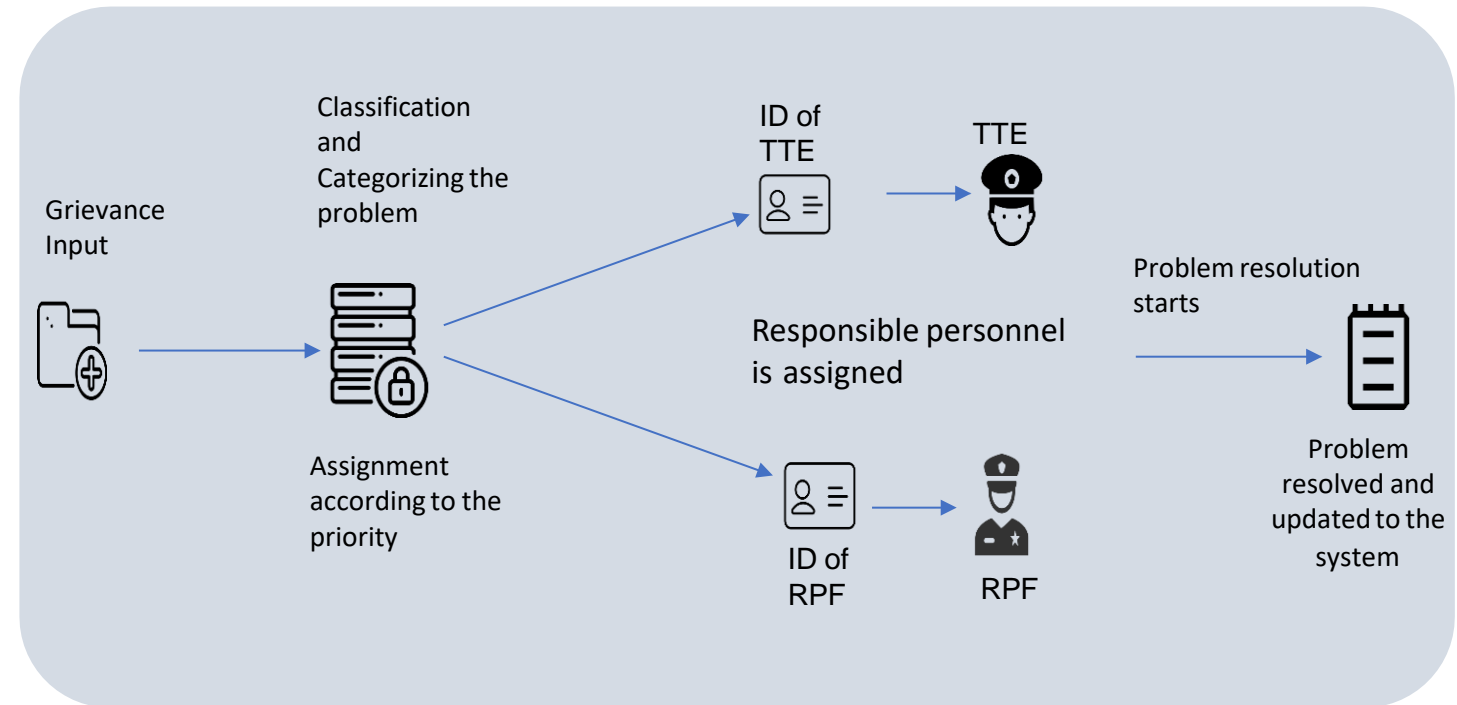**Step-5:** Assigns **responsibility** to responsible party.

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

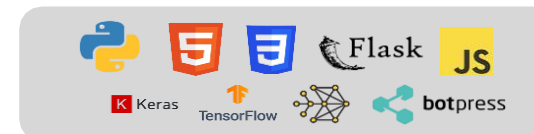**Step-7:** Assigns responsible personnel, based on PNR.

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 :

Grievance Input

Classification and Categorizing the problem

Assignment according to the priority

ID of TTE

TTE

Responsible personnel is assigned

ID of RPF

RPF

Problem resolution starts

Problem resolved and updated to the system

Technologies used :

Product Status :

65% Completed.

FEASIBILITY & VIABILITY

➡ **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 AND BENEFITS

➡ 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

RESEARCH AND REFERENCES

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	• Comparison of different CNN architectures for image classification. • Evaluation of performance metrics and optimization techniques for CNNs.	• 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	• Proposed a deep learning model for image classification • Optimized the model to improve efficiency and accuracy	• 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	• 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.	• 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 Shokarzad	• Integrating machine learning model into existing business software. • Model deployment for batch or real-time predictions.	• 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	• Theoretical and practical aspects of Keras and TensorFlow explained. • Architectures of TensorFlow and Keras simplified for easier understanding.	• Decision trees' sensitivity to changes in coordinate system • Limited training data and poor data quality mentioned as challenges