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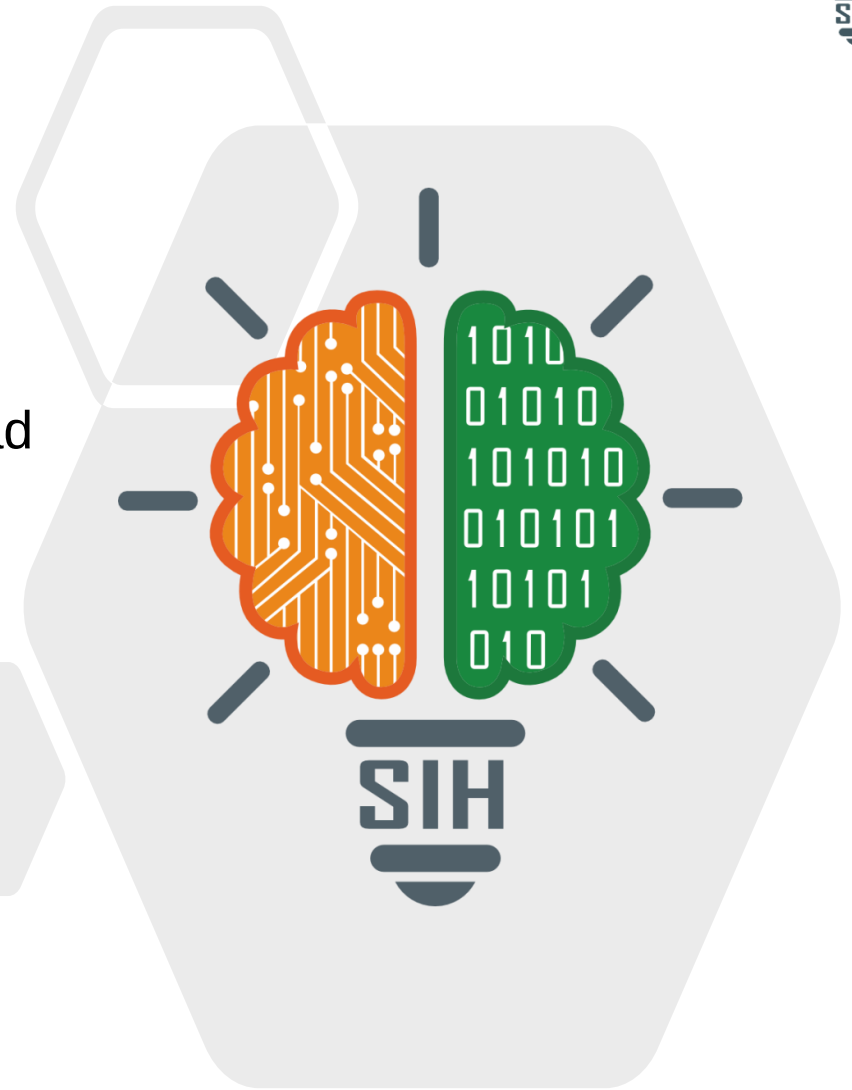
- **Problem Statement ID-** 1711
- **Problem Statement Title-** Enhancing Rail Madad with AI-powered Complaint Management.
- **Theme-** Smart Automation
- **PS Category-** Software
- **Team Name (Registered on portal)-** Nexus07



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AI POWERED RAIL MADAD

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Proposed Solution :

Our solution enhances Rail Madad by integrating Fine-tuned LLM and Image recognition to automate complaint categorization, prioritization, routing, and data extraction from multimedia, leading to faster resolution, efficient complaint management by Data base management and proactive issue prevention.

Automated Categorization & Prioritization	Fine-tuned LLMs and image recognition categorize complaints and prioritize urgent issues.
Enhanced Data Extraction	OCR, image recognition, and metadata analysis extract valuable information from multimedia.
Automated Response & Routing	Smart routing directs complaints to the appropriate department based on category and urgency.
Predictive Maintenance	AI models predict recurring issues for proactive maintenance, reducing future complaints.
Feedback & Continuous Improvement	Sentiment analysis of user feedback guides ongoing system improvements.
Training & Support	AI-powered dashboards and tools empower staff to resolve complaints efficiently.

How we address the problem:

Innovation and Uniqueness:

- **Multimodal AI Integration**: Combining image/video analysis, OCR, and NLP for a comprehensive solution that might effectively serve multimedia complaints.
- Visual data emphasis: Extracts insights from **images/videos(analysis),** giving richer understanding beyond text-based analysis of issues.
- **Real Time Handling**: Enables instant acknowledgement of the complaint and then faster responses.
- Predictive Maintenance: Made possible by AI for preventing possible **upcoming problems** through proactive anticipatory measures.

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TECHNICAL APPROACH

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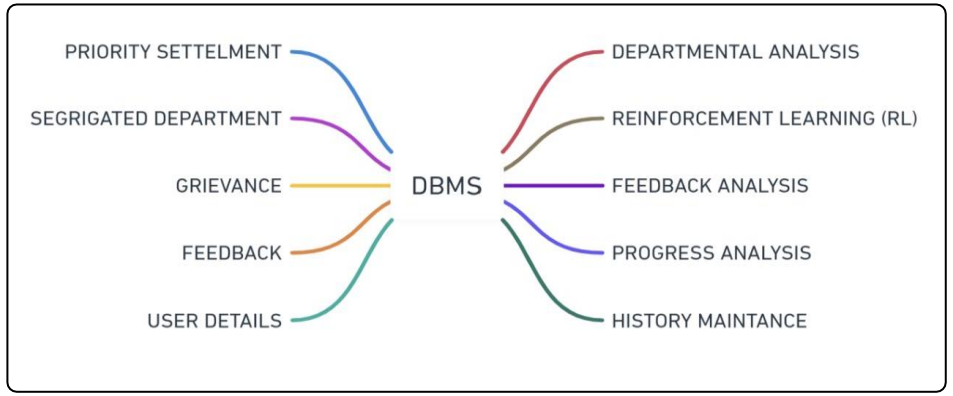
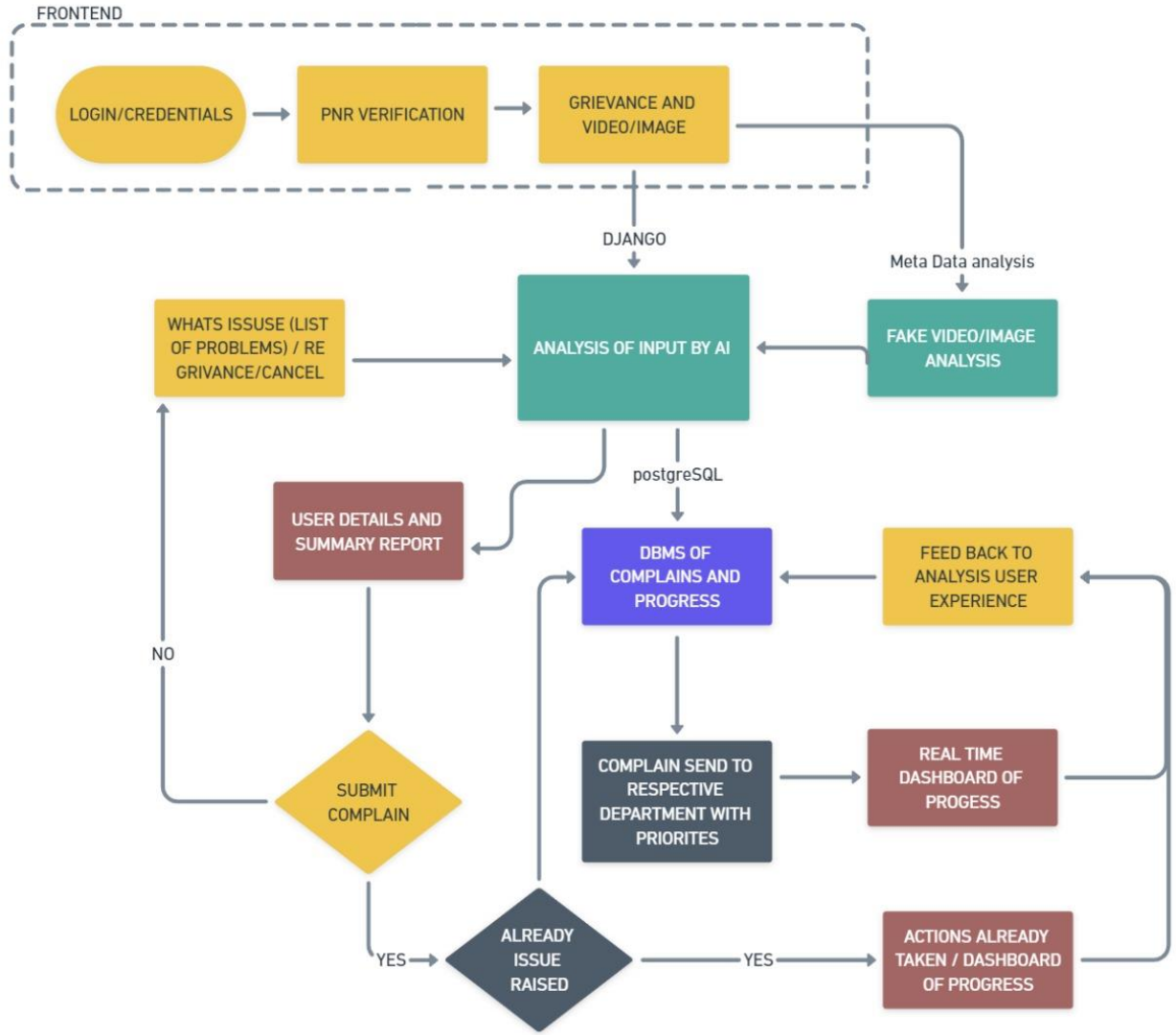
Tech Stack :

- **Frontend :** React Js, Tailwind CSS
- **Backend :** Django, Flask API, Python
- **Database :** Postgre SQL
- **Cloud Services :** Azure, GCP
- **UI Design :** Figma
- **ML model** : Llama 3.1 (ollama)
- **Image Analysis** : Tesseract OCR
- **Frameworks** : TensorFlow, Pytorch

Data-Analysis :



Flowchart :



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FEASIBILITY AND VIABILITY

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Feasibility:

- **Tech Ready:** Leverages existing AI/ML technologies for image/video analysis, NLP, and OCR.
- **Data Rich:** Access to Rail Madad's historical data and public datasets supports AI model training.
- **Seamless Integration:** Integrates smoothly with the current Rail Madad platform for efficient deployment.

Challenges & Strategies:

- **Data Quality:**
  - Challenge: Ensuring data accuracy.
  - Strategy: Robust data cleaning and validation.
- **User Adoption:**
  - Challenge: Building trust and encouraging usage.
  - Strategy: User-centric design with a friendly interface.
- **Ethical Considerations:**
  - Challenge: Addressing bias and protecting privacy.
  - Strategy: Bias mitigation techniques and data anonymization.
- **Scalability:**
  - Challenge: Handling increasing complaint volume.
  - Strategy: Deployment on scalable cloud infrastructure (Azure, AWS, Google Cloud).

SWOC Analysis :

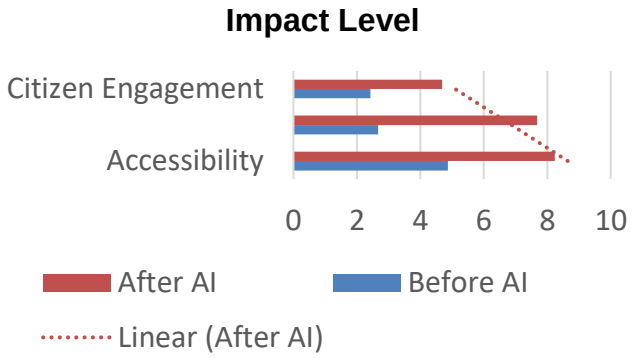
IMPACT AND BENEFITS

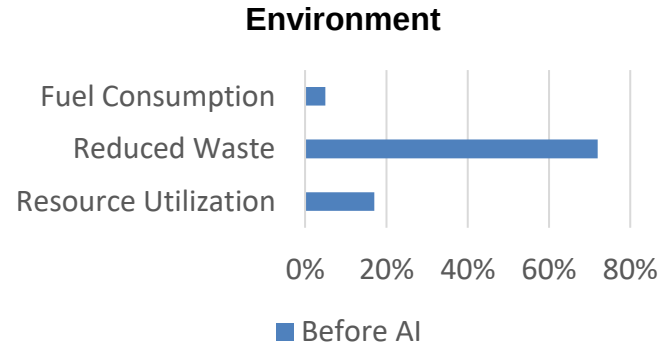
Enhancing the Rail Madad Experience:

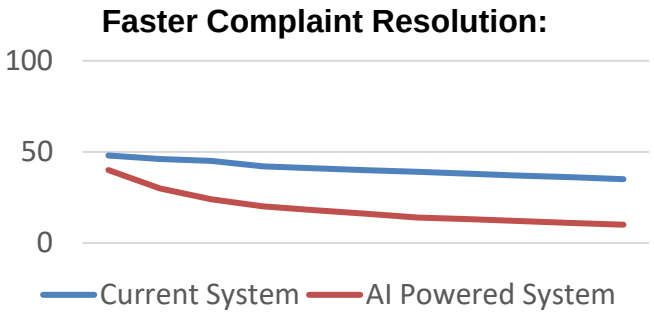
The AI solution increases accessibility for all users, promotes accountability, and fosters citizen engagement through improved communication channels.

Expect substantial cost savings, an estimated 40 million rupees annually, due to AI automation. Operational efficiency will increase by 20%, creating revenue opportunities through partnerships and subscriptions.

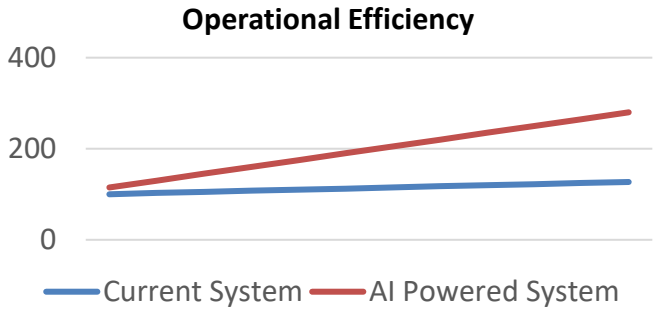
The AI system promotes resource efficiency, reducing waste by 800 tons annually and cutting fuel consumption by 3%, leading to a greener railway system.







Faster Resolutions! Projected reduction from 25 hours to 12 hours using AI.



Efficiency boost! Projected increase from 80 to 150 complaints resolved per staff member per month.

RESEARCH AND REFERENCES

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References:

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