INTELLIGENT CLASSIFICATION OF RURAL INFRASTRUCTURE PROJECTS (PMGSY)

(Problem Statement No. 35)

Presented By:
1. Harish Sonwale – School Of Engineering And Technology - C.S.E

edunet foundation

OUTLINE

- **Problem Statement**
- **Proposed System/Solution**
- **System Development Approach** (Technology Used)
- **Algorithm & Deployment**
- **Result (Output Image)**
- **Conclusion**
- **Future Scope**
- **References**

PROBLEM STATEMENT

The Pradhan Mantri Gram Sadak Yojana (PMGSY) is a flagship rural development program in India aimed at providing all-weather road connectivity to eligible unconnected habitations. Over time, the program has evolved into multiple schemes (PMGSY-I, PMGSY-II, RCPLWEA, etc.) with distinct objectives, funding mechanisms, and specifications.

For government bodies, infrastructure planners, and policy analysts, accurate and efficient classification of thousands of ongoing and completed projects is essential for effective monitoring, transparent budget allocation, and long-term impact assessment.

Manual classification is time-consuming, error-prone, and not scalable. This project aims to design, build, and evaluate a machine learning model capable of automatically classifying road or bridge construction projects into the correct PMGSY scheme using their physical and financial characteristics.

.

PROPOSED SOLUTION

- **Proposed System:**
  An AI model to automatically classify PMGSY projects.
- **Data Collection:**
  Historical PMGSY project data from AI Kosh.
- **Data Preprocessing:**
  Clean and preprocess data; automated via IBM AutoAI.
- **Algorithm:**
  Multi-class classification using IBM AutoAI to select the best model.
- **Deployment:**
  Deploy on IBM Cloud (Watsonx.ai) as a real-time web service.
- **Evaluation:**
  Assess performance using accuracy.

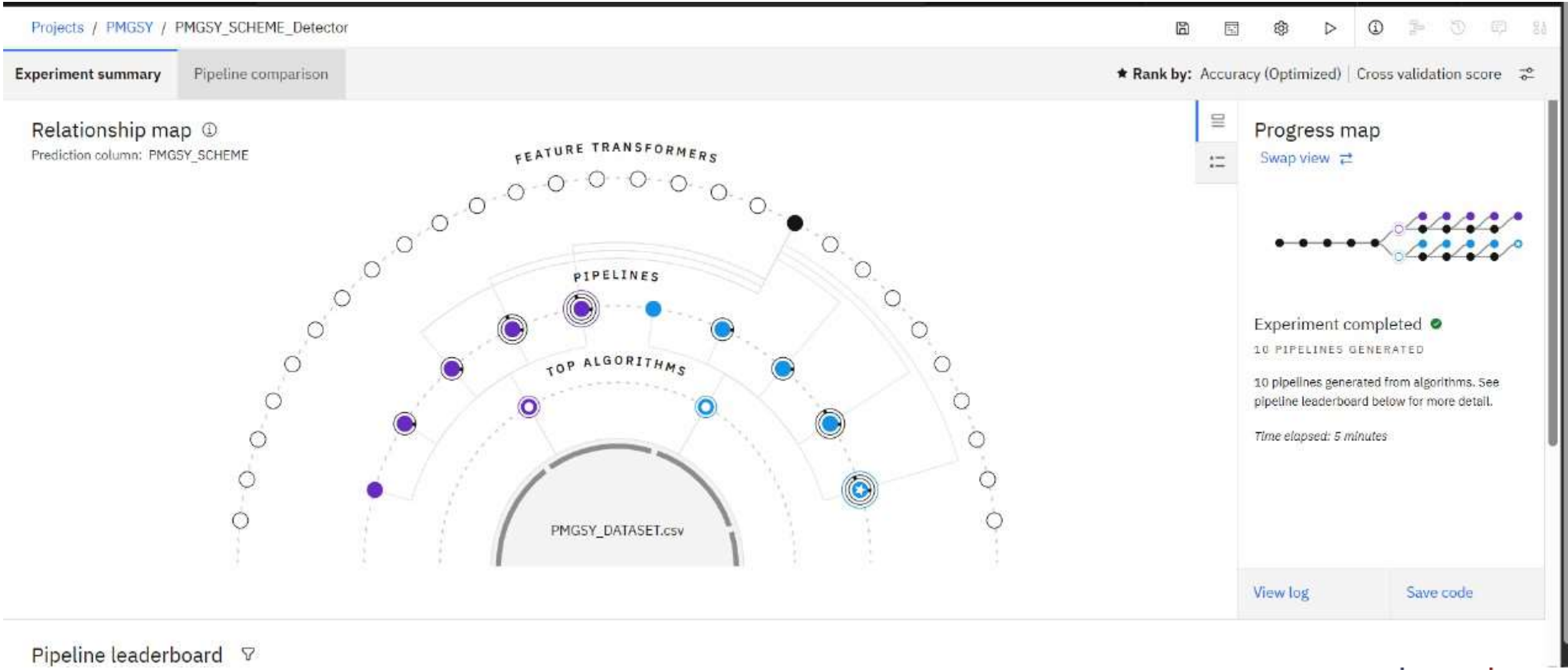
SYSTEM APPROACH

- System Requirements:
  - A cloud-based platform: IBM Watsonx.ai Studio on IBM Cloud.
  - An automated tool for model development: IBM AutoAI.
- Library Required to build the model:
  - ibm-watsonx-ai: For interacting with the IBM platform.
  - scikit-learn: For machine learning components.
  - autoai-libs: For running AutoAI generated pipelines.
  - pandas: For data manipulation.

ALGORITHM & DEPLOYMENT

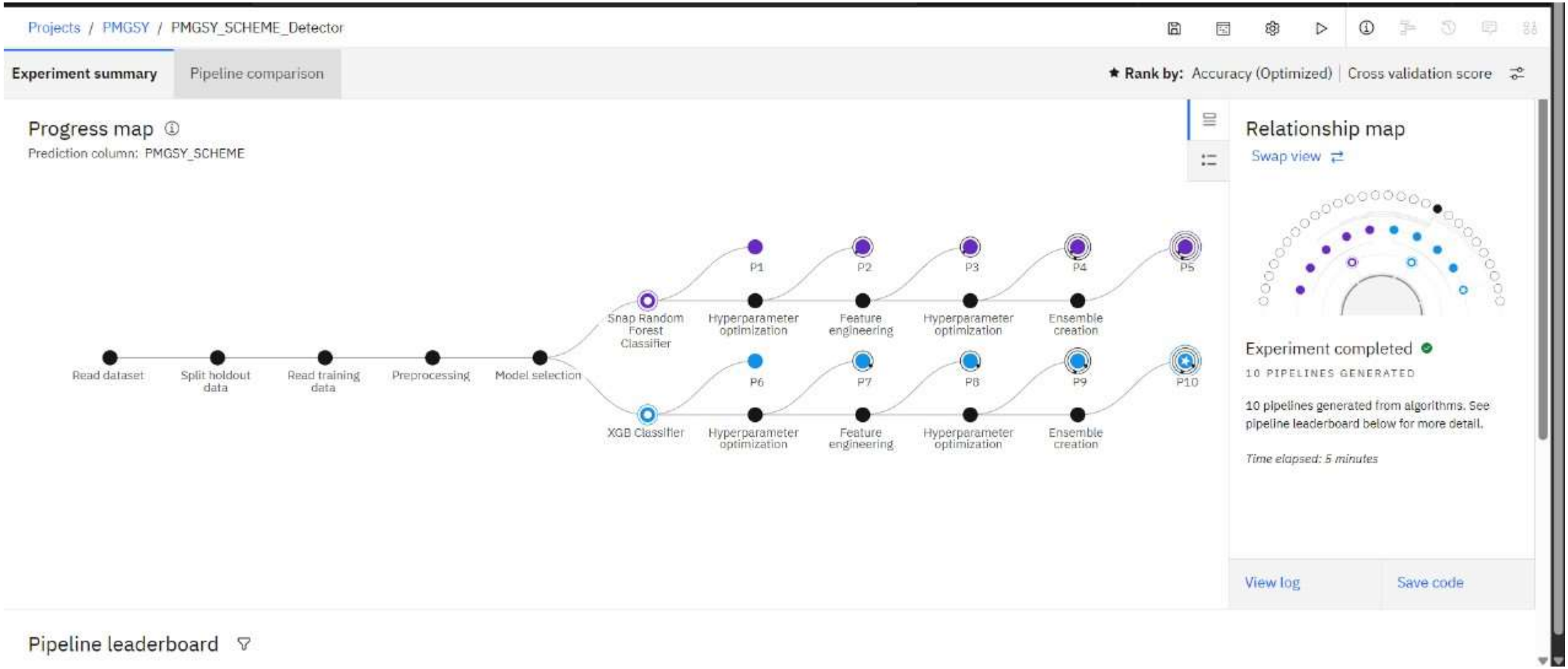
- Algorithm Selection:
  - IBM's AutoAI was chosen to automate the algorithm selection process. It trained and evaluated several classification models like Logistic Regression, Decision Trees, and XGBoost.
  - The XGBoost Classifier was automatically selected as the best model based on its high accuracy for this problem.
- Data Input:
  - The algorithm uses input features like STATE_NAME, DISTRICT_NAME, LENGTH_OF_ROAD_WORK_SANCTIONED, COST_OF_WORKS_SANCTIONED, and other financial/physical parameters.
- Training Process:
  - AutoAI automated the entire training pipeline, including feature engineering, hyperparameter tuning, and model validation.
- Deployment:
  - The best pipeline was saved and deployed as an Online Deployment (Web Service) on IBM Watsonx.ai. This creates a REST API endpoint for getting real-time predictions.

RESULT

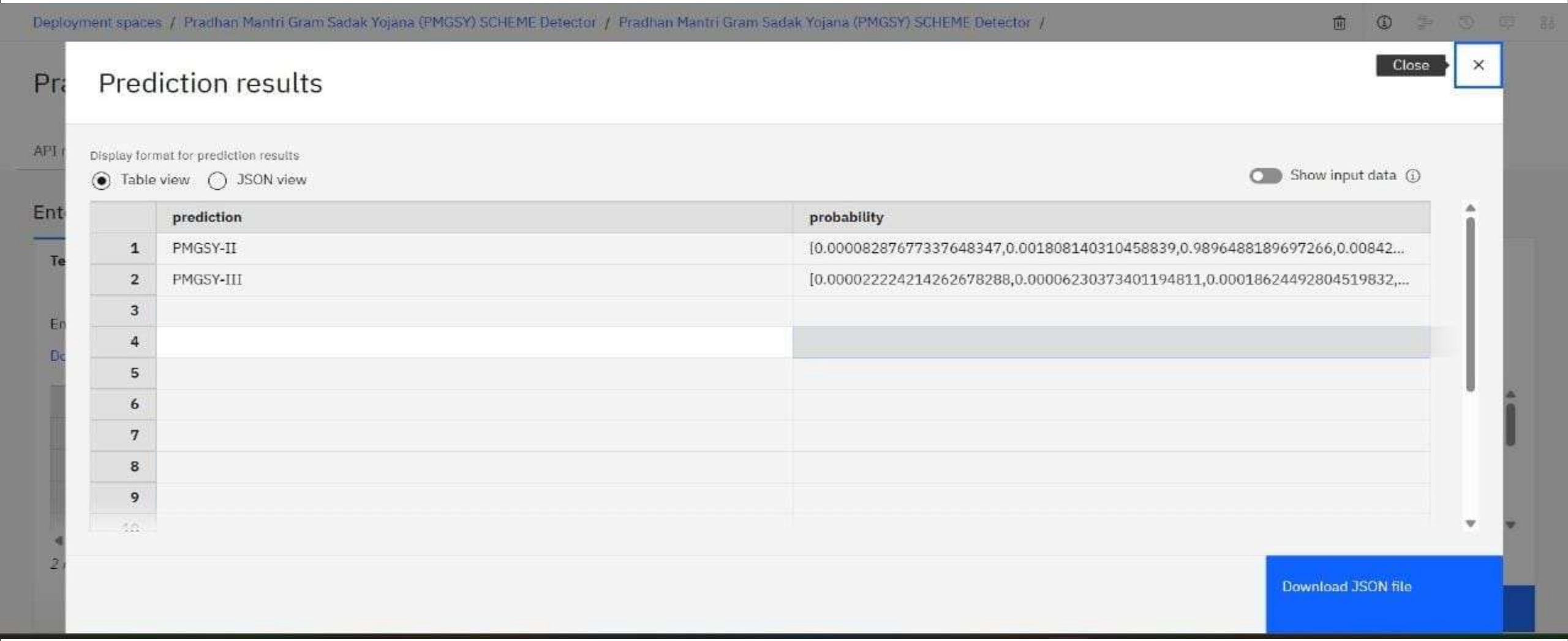


edunet foundation

RESULT



RESULT



CONCLUSION

- The project provided a complete, automated solution for classifying rural infrastructure projects using **IBM AutoAI**.
- It minimized manual effort, reduced errors, and saved significant processing time.
- Enabled **efficient monitoring** and **transparent financial planning** for government agencies.
- Deployment on **IBM Cloud** ensures scalability, reliability, and accessibility for real-world implementation.

FUTURE SCOPE

- **Integration of Live Project Feeds:** Enhance the system by syncing real-time progress updates directly from on-site sources.
- **Insightful Monitoring Dashboard:** Design an intuitive interface to visualize classification insights and regional project performance.
- **Forecasting & Risk Analysis:** Upgrade the model to anticipate schedule delays or financial overruns before they occur.
- **Next-Gen AI Applications:** Implement methods such as NLP to interpret detailed project documentation for improved classification depth.

REFERENCES

- **Dataset Source:** Pradhan Mantri Gram Sadak Yojana (PMGSY) dataset from **AI Kosh**, Government of India.

  Access link: AI Kosh PMGSY Dataset

- **Platform Guide:** Official IBM Watsonx.ai documentation.

- **Supporting Literature:** Research studies on machine learning applications in public policy and infrastructure development.

IBM CERTIFICATIONS

In recognition of the commitment to achieve professional excellence

Getting Started with Artificial Intelligence

IBM SkillsBuild

IBM

Harish Sonwale

Has successfully satisfied the requirements for:

Getting Started with Artificial Intelligence

Issued on: Jul 17, 2025

Issued by: IBM SkillsBuild

Verify: https://www.credly.com/badges/91a5982a-48d9-4a96-bc5f-d6019c48bf8d

IBM

edunet foundation

IBM CERTIFICATIONS

In recognition of the commitment to achieve professional excellence

Journey to Cloud: Envisioning Your Solution

IBM SkillsBuild

IBM

Harish Sonwale

Has successfully satisfied the requirements for:

Journey to Cloud: Envisioning Your Solution

Issued on: Jul 17, 2025

Issued by: IBM SkillsBuild

Verify: https://www.credly.com/badges/44915a87-2e16-416a-ac0b-bde2fea75c3f

IBM

edunet foundation

IBM CERTIFICATIONS

8/8/25, 10:28 PM Completion Certificate | SkillsBuild

IBM **SkillsBuild** Completion Certificate

This certificate is presented to

Harish Sonwale

for the completion of

Lab: Retrieval Augmented Generation with LangChain

(ALM-COURSE_3824998)

According to the Adobe Learning Manager system of record

Completion date: 07 Aug 2025 (GMT) **Learning hours:** 20 mins

THANK YOU

edunet
foundation