
IBM AICTE PROJECT

INTELLIGENT SCHEME CLASSIFICATION OF PMGSY PROJECTS USING IBM CLOUD

Presented By:

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OUTLINE

- **Problem Statement** (Should not include solution)
- **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 that provides all-weather road connectivity to unconnected habitations. Over time, the program has evolved through various schemes (PMGSY-I, PMGSY-II, RCPLWEA), each with specific criteria.

Manually classifying thousands of ongoing and completed projects into the correct scheme is time-consuming and prone to errors.

There is a critical need for an intelligent system to automate this classification using available project data.

PROPOSED SOLUTION

The proposed system is a machine learning-based classifier that predicts the correct PMGSY scheme (PMGSY-I, II, RCPLWEA) for a given rural infrastructure project based on:

- Physical characteristics (project length, type, geography)
- Financial data (estimated cost)
- Geographic attributes (state, district)
- The goal is to assist government bodies and planners in quickly categorizing projects, improving monitoring, and enabling better policy decisions.

SYSTEM APPROACH

Tools & Technologies Used:

- Platform: IBM Cloud Lite
- Notebook Environment: IBM Watson.ai Studio
- Modeling Libraries: scikit-learn, pandas, matplotlib
- Deployment: IBM Watson Machine Learning
- Data: PMGSY dataset from AI Kosh

Preprocessing:

- Remove null values
- Derived features like cost_per_km , completion_ratio
- Encoded Categorical Fields (eg. State,district)

ALGORITHM & DEPLOYMENT

Algorithm Used: Batched Tree Ensemble Classifier (XGB Classifier)

Input Features:

- STATE_NAME, DISTRICT_NAME
- NO_OF_ROADS_SANCTIONED, LENGTH_SANCTIONED
- COST_OF_WORKS_SANCTIONED, LENGTH_COMPLETED
- NO_OF_BRIDGES_SANCTIONED, COST_BALANCE, LENGTH_BALANCE etc...

Target Variable: PMGYSY_SCHEME

Cross Validation Accuracy: 92.4%

Deployment:

- Model trained via **AutoAI** on **IBM Watson Studio**
- Deployed using Watson Machine Learning
- REST API created for inference

PMGSY ✓ Deployed Online

API reference Test

Code snippets

cURL

Java

JavaScript

Python

Scala

```
import requests

# NOTE: you must manually set API_KEY below using information retrieved from your IBM Cloud account (https://iam.cloud.ibm.com/identity/token)
API_KEY = "<your API key>"
token_response = requests.post('https://iam.cloud.ibm.com/identity/token', data={"apikey": API_KEY, "grant": "mltoken"})
mltoken = token_response.json()["access_token"]

header = {'Content-Type': 'application/json', 'Authorization': 'Bearer ' + mltoken}

# NOTE: manually define and pass the array(s) of values to be scored in the next line
payload_scoring = {"input_data": [
    {
        "fields": [array_of_input_fields],
        "values": [array_of_values_to_be_scored, another_array_of_values_to_be_scored]
```

About this deployment

Name

PMGSY

Description

No description provided.

Deployment Details

Deployment ID: 6d7e7e4b-3480-43...

Serving name:

No serving name.

Software specification:

[hybrid_0.1](#) ⚙️

Hybrid pipeline software specifications:

[autoai-kb_rt24.1-py3.11](#)

Copies:

1

Tags

Add tags to make assets easier to find.

code snippets

cURL

Java

JavaScript

Python

Scala

```
        "values": [array_of_values_to_be_scored, another_array_of_values_to_be_scored]
    }
}]

response_scoring = requests.post('https://private.eu-gb.ml.cloud.ibm.com/ml/v4/deployments/6d7e7e4b-3480-43...
headers={'Authorization': 'Bearer ' + mltoken})

print("Scoring response")
try:
    print(response_scoring.json())
except ValueError:
    print(response_scoring.text)
except Exception as e:
    print(f"An unexpected error occurred: {e}")
```

No description provided.

Deployment Details

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[hybrid_0.1](#) 

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[autoai-kb_rt24.1-py3.11](#)

Copies: 

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Tags 

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RESULT

Experiment summary

Pipeline comparison

★ Rank by: Accuracy (Optimized) | Cross validation score

View log

Save code

Pipeline leaderboard

	Rank	Name	Algorithm	Specialization	Accuracy (Optimized) Cross Validation	Enhancements	Build time
★	1	Pipeline 10	Batched Tree Ensemble Classifier (XGB Classifier)	INCR	0.924	HPO-1 FE HPO-2 BATCH	Save as
	2	Pipeline 9	XGB Classifier		0.924	HPO-1 FE HPO-2	00:01:58
	3	Pipeline 8	XGB Classifier		0.924	HPO-1 FE	00:01:11
	4	Pipeline 7	XGB Classifier		0.918	HPO-1	00:00:23

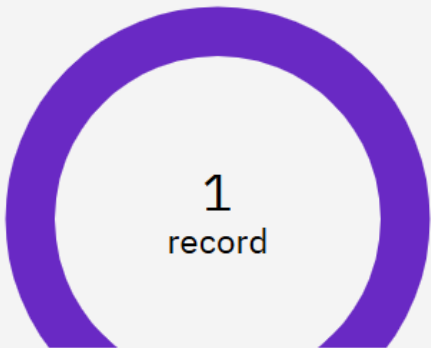


PM Prediction results

Prediction type

Multiclass classification

Prediction percentage



Display format for prediction results

☒ Table view ☐ JSON view



Show input data ⓘ

	Prediction	Confidence	STATE_NAME	DI
1	PMGSY-III	36%	Andaman	Ni
2				
3				
4				
5				
6				

Download JSON file

CONCLUSION

- An effective classification model was built for **PMGSY scheme** categorization.
- Used **IBM Cloud AutoAI** for rapid model generation and evaluation.
- Achieved high accuracy of **92.4%** with real project-level features.
- Significantly improves speed and reliability of rural project monitoring.

FUTURE SCOPE

- Integrate map-based data or terrain classification.
- Incorporate time-series progress tracking using expenditure data.
- Enable real-time classification via mobile app or web dashboard.
- Analyze for fairness and regional bias.

REFERENCES

1. PMGSY Official Portal – <https://pmgsy.nic.in>
 2. AI Kosh Dataset – <https://aikosh.indiaai.gov.in>
 3. IBM Watson Studio & AutoAI Documentation
 4. scikit-learn API Reference
 5. Hands-On Machine Learning
-
- **Github link:** https://github.com/saumyapal614/AICTE_IBM_edunet_ML
 - **Dataset link:**
https://aikosh.indiaai.gov.in/web/datasets/details/pradhan_mantri_gram_sadak_yojna_pmgsy.html

Github link: https://github.com/saumyapal614/AICTE_IBM_edunet_ML

Dataset link:

https://aikosh.indiaai.gov.in/web/datasets/details/pradhan_mantri_gram_sadak_yojna_pmgsy.html

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Journey to Cloud: Envisioning Your Solution

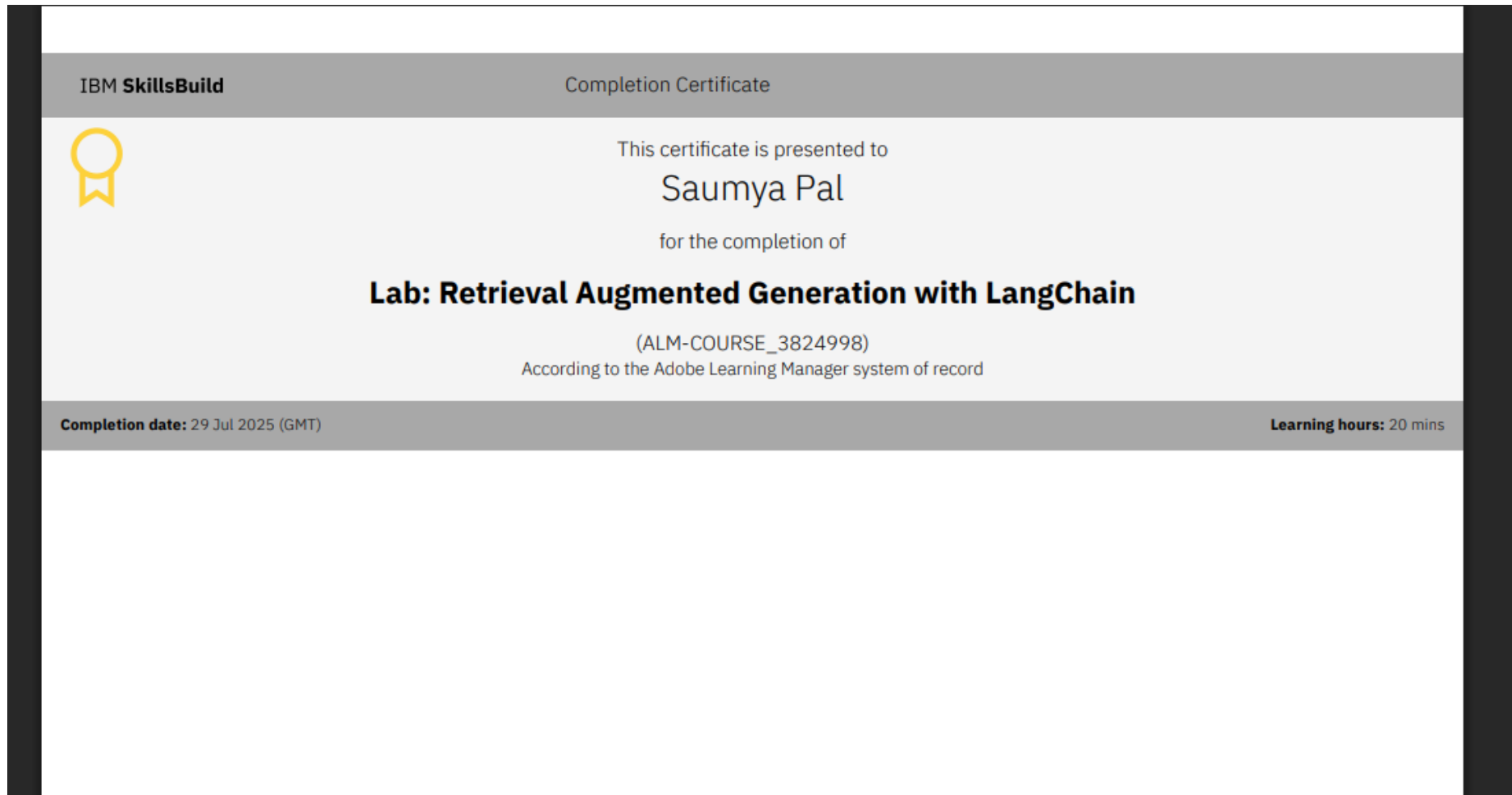


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