
CAPSTONE PROJECT

PREDICTING ELIGIBILITY FOR NSAP SCHEMES

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OUTLINE

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PROBLEM STATEMENT

- The National Social Assistance Programme (NSAP) is a critical welfare initiative aimed at providing financial support to vulnerable sections of society, including the elderly, widows, and persons with disabilities. However, the process of identifying and categorizing eligible beneficiaries is often manual, inconsistent, and subject to human error.
- Due to the lack of a standardized data-driven approach, eligible individuals are sometimes overlooked or misclassified, leading to delays or denial of assistance. Moreover, with the increasing volume of applications and diverse socio-economic conditions across regions, it becomes challenging for authorities to efficiently and accurately assign applicants to the appropriate welfare schemes under NSAP.

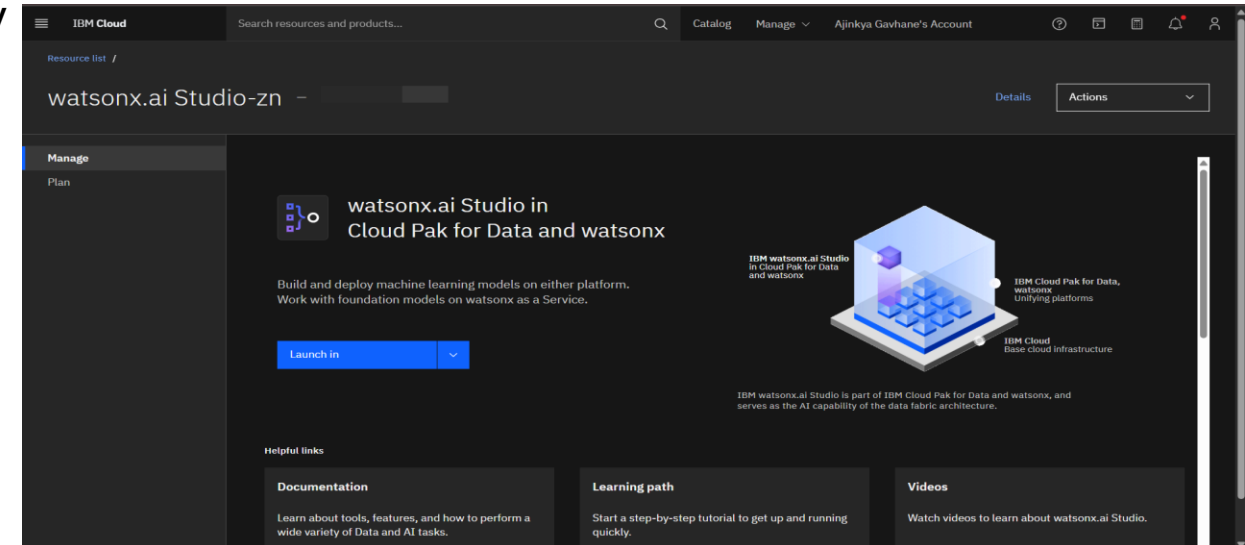
PROPOSED SOLUTION

- I have developed a model using a **Decision Tree algorithm** to predict eligibility for NSAP schemes like IGNOAPS, IGNWPS, and IGNDPS.
- The model takes into account factors such as **age, gender, income level, disability status**.
- It is trained on a realistic dataset and gives quick and reliable eligibility results.
- The system helps identify whether an individual qualifies for the scheme in a **transparent and unbiased** manner.
- This model aims to support government officials in **faster and fair decision-making**.

SYSTEM APPROACH

Platform Used: IBM Cloud – Watsonx.ai Studio.

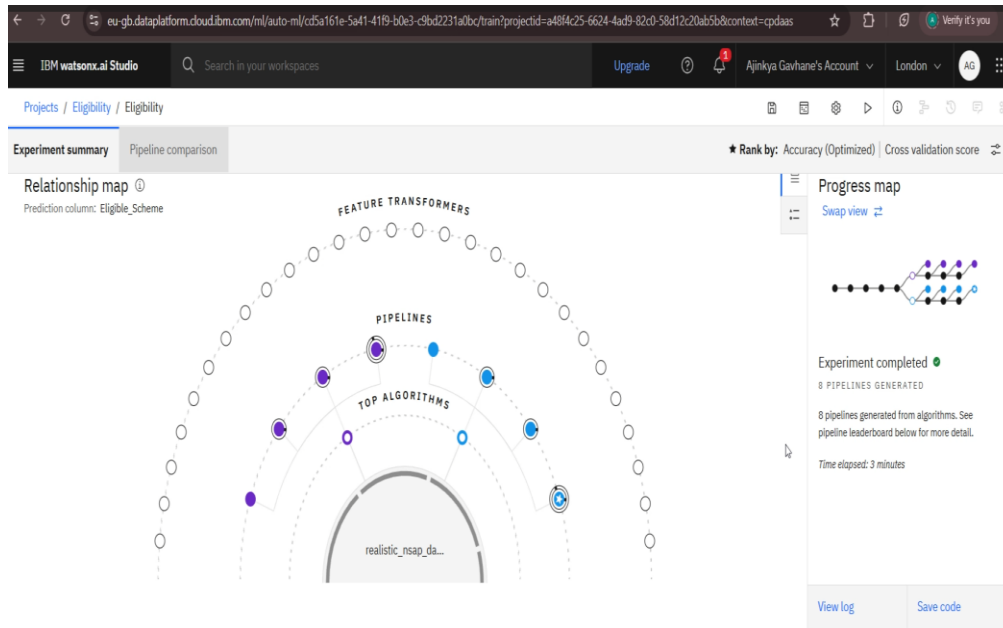
- Objective:** Built an AI model to **predict eligibility for NSAP schemes** based on socio-economic and demographic parameters
- Development Steps:**
 - Uploaded the NSAP dataset to Watsonx.ai
 - Utilized **AutoAI** to explore multiple models and select the best-performing one
 - Decision Tree algorithm** was finalized based on high accuracy and interpretability
 - Analyzed key features that influence NSAP eligibility
- System Requirements:**
 - IBM Cloud account with Watsonx.ai access
 - Stable internet connection and updated browser



ALGORITHM & DEPLOYMENT

Algorithm Selection: Decision Tree Classifier

- It mimics **human decision-making**, making the results easy to interpret and explain.
- Handles both **categorical and numerical data**, which is ideal for socio-economic datasets like NSAP.
- Works well even when there are **non-linear relationships** between variables.
- It's **fast to train**, requires less data preprocessing. and is less sensitive to missing values.



Pipeline leaderboard

Rank	Name	Algorithm	Accuracy (Optimized)	Enhancements	Build time	
			Cross Validation			
★ 1	Pipeline 8	Decision Tree Classifier	1	HPO-1 FE HPO-2	00:00:25	Save as
2	Pipeline 7	Decision Tree Classifier	1	HPO-1 FE	00:00:22	
3	Pipeline 6	Decision Tree Classifier	1	HPO-1	00:00:03	
4	Pipeline 5	Decision Tree Classifier	1	None	00:00:01	

ALGORITHM & DEPLOYMENT

Data Input :

- The model was trained on **socio-economic and demographic data** relevant to NSAP eligibility.
- Key input features included:
 - IGNOAPS** (Indira Gandhi National Old Age Pension Scheme)
 - IGNWPS** (Indira Gandhi National Widow Pension Scheme)
 - IGNDPS** (Indira Gandhi National Disability Pension Scheme)
 - Age**
 - Gender**
 - Marital Status**
 - Disability status**
 - BPL (Below Poverty Line) status**

Enter input data

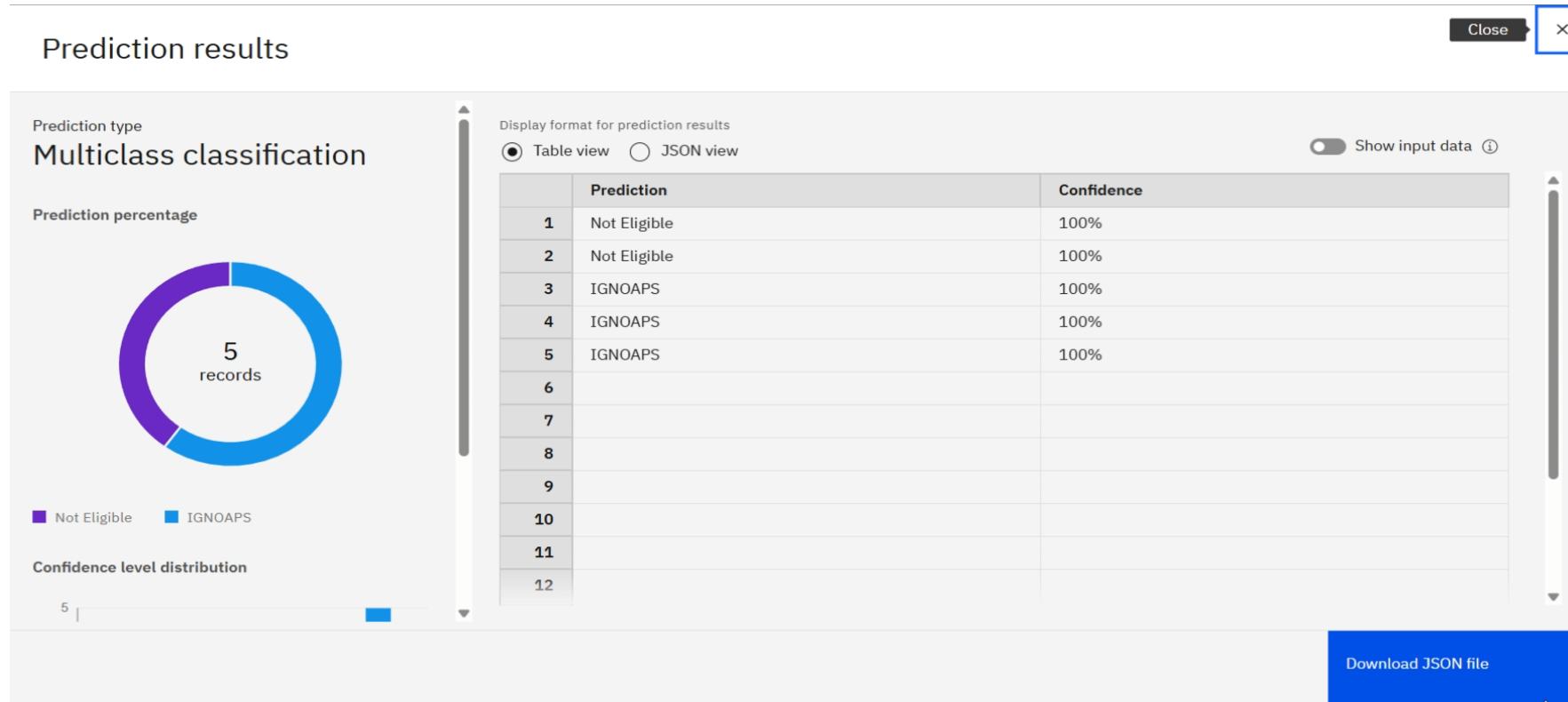
Text JSON

Enter data manually or use a CSV file to populate the spreadsheet. Max file size is 50 MB.

[Download CSV template](#) [Browse local files](#) [Search in space](#) [Clear all](#) x

	Age (double)	Gender (other)	Marital_Status (other)	Disability_Percent (double)	BPL_Status (other)
1	33	male	single	49	no
2	54	male	married	39	yes
3	63	male	married	9	yes
4	82	female	widowed	1	yes
5	74	male	single	76	yes
6					

RESULT



CONCLUSION

The model effectively predicts **NSAP scheme eligibility** based on user attributes like age, gender, disability, income

- Using the **Decision Tree Classifier**, the system provides clear, interpretable decisions, making it suitable for use by NGOs or government agencies.
- **Challenges faced** included:
 - Limited access to authentic real-world data.
 - Ensuring data quality and balance across categories.
 - Avoiding overfitting while maintaining accuracy.

FUTURE SCOPE

- **Incorporate additional data sources** such as:
 - Aadhaar-linked demographic data
 - Regional poverty indexes
 - Government census datasets for accuracy
- **Optimize the model** by:
 - Testing other algorithms like Random Forest .
 - Performing hyperparameter tuning for better precision
 - Applying feature selection to reduce noise and improve speed

REFERENCES

- **Scikit-learn Documentation** :Comprehensive guide to machine learning algorithms including Decision Tree Classifier.
- **A Survey on Decision Tree Algorithms** – Research paper reviewing the use and advantages of decision trees. (*International Journal of Advanced Research in Computer Science and Software Engineering, 2013*)
- **Government of India – NSAP Guidelines** – Official framework for eligibility under the National Social Assistance Programme.

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THANK YOU