
CAPSTONE PROJECT

DIGIDHARMA: AUTOAI-POWERED PREDICTION OF TELE-LAW ENGAGEMENT

Presented By:

Student Name: Durga Reddy Karri

College Name: Lovely Professional University

Department: Computer Science and Engineering

OUTLINE

- Problem Statement
- Proposed System/Solution
- System Development Approach
- Algorithm & Deployment
- Result (Output Image)
- Conclusion
- Future Scope
- References
- Git-hub Link
- IBM Certifications

PROBLEM STATEMENT

- The problem focuses on the **inequality in access to Tele-Law services** across India. While the initiative has expanded to many states and districts, there's a noticeable lack of understanding about **how different demographic groups and regions are using these services**.
- Certain **marginalized communities**—such as **Scheduled Castes (SC), Scheduled Tribes (ST), and Other Backward Classes (OBC)**—appear to be **underrepresented** in the data. Similarly, some **districts show very low levels of outreach or engagement**, which raises questions about how fairly the legal aid services are reaching the population.
- Another complication is that the **number of CSCs (Common Service Centres)** varies from region to region, making it difficult to make direct comparisons between areas. This variation creates complexity in assessing whether legal aid is being distributed equitably across all districts and communities.

PROPOSED SOLUTION

In this project, a machine learning model is developed to **predict the total number of Tele-Law case registrations** (Total) for each district. The prediction is based on input features such as:

- Number of CSCs in the district
- Gender-wise data (Female, Male)
- Caste-wise data (SC, ST, OBC, General)
- Geographic identifiers (State/UT, District)

The target variable is the **Total case registrations**, which represents the volume of legal aid usage in each region. The model learns how demographic and infrastructural factors influence service utilization, allowing for forecasting of future case registration volumes and identifying patterns of underutilization.

SYSTEM APPROACH

This section outlines the overall strategy, tools, and methodology used to develop and deploy a machine learning model that predicts the **total number of Tele-Law case registrations** across districts using IBM Watsonx.ai's AutoAI.

System Requirements:

Component	Specification
Device	Laptop/Desktop with minimum 4GB RAM (8GB+ recommended for smoother operation)
Internet Speed	Stable internet connection (minimum 10 Mbps recommended)
Browser	Google Chrome / Mozilla Firefox (latest version recommended)
Cloud Environment	IBM Cloud Academic Portal
Account Access	IBM Cloud account with access to Watsonx.ai and Cloud Object Storage
Platform	IBM Watsonx.ai (AutoAI)
Runtime	Watsonx.ai Runtime service (provisioned for model building and deployment)
Deployment	AutoAI-generated model deployed in a Watsonx.ai Deployment Space
Dataset Format	CSV (Tele-Law Case Registrations.csv)

SYSTEM APPROACH

Although IBM AutoAI handles model creation without manual coding, the backend utilizes several essential libraries and frameworks for data processing, model training, and evaluation:

Libraries Required:

Library/Tool	Purpose
pandas	Data manipulation and analysis
numpy	Numerical computations
scikit-learn	Machine learning models, preprocessing, pipeline creation
xgboost / lightgbm	Advanced tree-based boosting algorithms (AutoAI uses automatically)
watson-machine-learning-client	Interacting with deployed models on IBM Cloud

Note: All of these are handled automatically within the AutoAI pipeline; no manual installation or coding is required unless additional customization is needed outside the AutoAI interface.

ALGORITHM & DEPLOYMENT

ALGORITHM OVERVIEW

- This project uses **IBM Watsonx.ai AutoAI**, which automates model training and selection. It performs:
 - **Automatic preprocessing:** Handles missing values, data types, and feature engineering.
 - **Model generation:** Builds multiple pipelines using algorithms like:
 - Random Forest Regressor
 - Gradient Boosting (XGBoost/LightGBM)
 - Decision Tree, Linear, and Ridge/Lasso Regression
 - **Evaluation:** Ranks models using metrics like R^2 , **MAE**, and **RMSE**.
 - **Selection:** Chooses the best-performing pipeline for deployment.

ALGORITHM & DEPLOYMENT

Model Deployment

- After identifying the best-performing pipeline, the model is **deployed to the cloud** using IBM Watsonx.ai's integrated tools:
- **Model Promotion:**
 - The selected model is **promoted to a deployment space** within Watsonx.ai.
- **Deployment Creation:**
 - A **new deployment** is created (real-time or batch) to make the model accessible via API.
 - The deployment is named and version-controlled.
- **Model Testing:**
 - The deployed model is tested using **new input values** directly from the cloud UI.
 - The predicted output (i.e., **total case registrations**) is generated in real time.

RESULT

eu-gb.dataplatfrom.cloud.ibm.com/ml-runtime/deployments/1474b735-d861-4922-a594-acb7e46dc7a4/test?space_id=15fd3f1f-3508-467d-af01-4272c84a401b&context=cpdaas&flush...

IBM watsonx.ai Studio Search in your workspaces Upgrade ? 1 Durga Reddy Karri's Account London OK

Deployment spaces / DigiDharma AI / P8 - Ridge: DigiDharma: Tracing Legal Equity

DigiDharma ✓ Deployed Online

API reference **Test**

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](#)

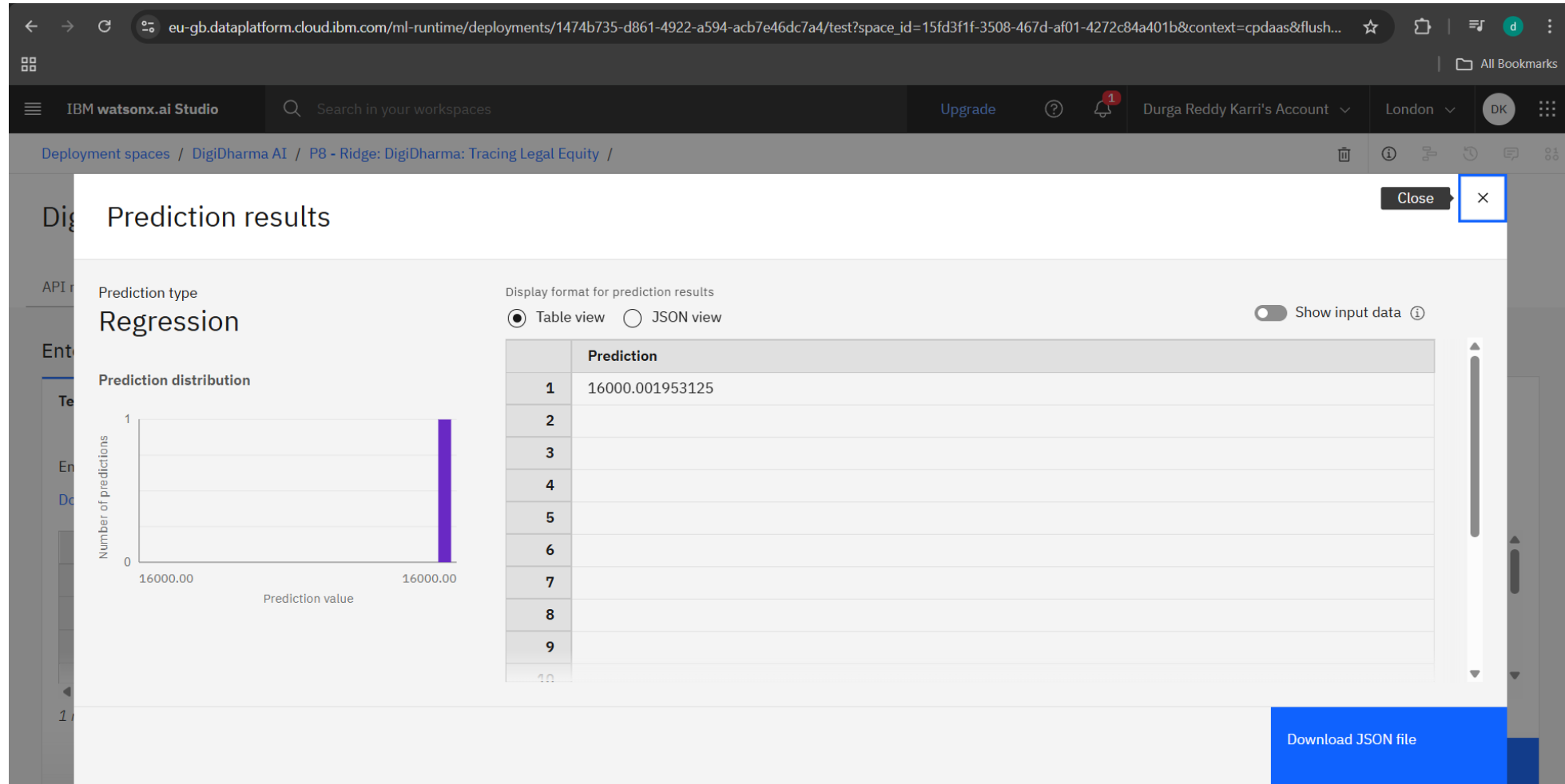
	Category (other)	States/UT's (other)	Districts (other)	No. of CSCs (integer)	Female (integer)	Male (integer)	General (integer)	OBC (integer)	SC (integer)	ST (integer)
1	Case Registered	Andhra Pradesh	Visakhapatnam	79	6137	9863	6709	3020	2467	3804
2										
3										

1 row, 11 columns

Predict

INPUT DATA

RESULT



PREDICTION RESULT

RESULT

AutoSave Off | Tele-Law Case Registrations | Search | Comments | Share

File Home Insert Page Layout Formulas Data Review View Developer Help Acrobat Power Pivot

Get & Transform Data: Get Data (From Text/CSV, From Web, From Table/Range), Recent Sources, Existing Connections

Queries & Connections: Refresh All, Properties, Workbook Links

Sort & Filter: Sort, Filter, Clear, Reapply, Advanced

Data Tools: Text to Columns, Remove Duplicates, Data Validation, Flash Fill, Consolidate, Data Model

Forecast: What-If Analysis, Forecast Sheet

Outline: Group, Ungroup, Subtotal

Analysis: Data Analysis

Formulas: L27, fx, 16000

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	Category	States/UT's	District	No. of CSCs	Female	Male	Total	General	OBC	SC	ST	Total									
27	Case Registered	Andhra Pradesh	Visakhapatnam	79	6137	9863	16000	6709	3020	2467	3804	16000									
1574																					
1575																					
1576																					
1577																					
1578																					
1579																					
1580																					
1581																					
1582																					
1583																					
1584																					
1585																					
1586																					
1587																					
1588																					
1589																					
1590																					
1591																					
1592																					
1593																					
1594																					
1595																					
1596																					
1597																					
1598																					
1599																					

Tele-Law Case Registrations | Ready | 1 of 1572 records found | Accessibility: Unavailable | 100%

MODEL PREDICTION ACCURACY: COMPARISON WITH ACTUAL DATA

CONCLUSION

- This project effectively used **IBM Watsonx.ai's AutoAI** to develop a predictive model for estimating **Tele-Law case registrations** across Indian districts. By leveraging demographic inputs like **gender, caste, and CSC availability**, the model uncovers key utilization patterns and highlights regions with possible disparities in legal aid access.
- AutoAI streamlined the entire process, from **data preprocessing** to **model selection and evaluation**, enabling the creation of a high-performing regression model with minimal manual effort. The insights gained from this model can help **optimize CSC distribution**, identify **underrepresented communities**, and support **inclusive planning** for legal service delivery—ultimately contributing to a more equitable justice system.
- Moving forward, this predictive system can be enhanced by integrating **real-time data updates**, incorporating **socio-economic indicators**, and expanding the feature set to include factors like literacy rate or digital accessibility.

FUTURE SCOPE

- **Incorporate More Features:** Enhance the model by adding socio-economic indicators such as literacy rate, income level, and digital connectivity to improve prediction accuracy.
- **Real-Time Data Integration:** Enable the system to work with live Tele-Law data feeds for continuous model updates and timely insights.
- **District-Level Targeting:** Use the model outputs to identify and prioritize low-performing districts for focused outreach and CSC deployment.
- **Scalable Deployment:** Extend the model across other government schemes to assess service accessibility and inclusion at a national scale.
- **Dashboard Integration:** Link predictions with an interactive dashboard to help policymakers visualize disparities and act accordingly.
- **Predictive Alert System:** Develop a system that flags regions at risk of low utilization in advance, enabling preventive action.

REFERENCES

- Official Dataset Source:
[District-wise Tele-Law Case Registration and Advice Enabled Data \(FY 2021–22 to 2024–25\) – data.gov.in](#)
- IBM Cloud Platform: <https://cloud.ibm.com/>
- IBM Cloud: *Watsonx.ai Studio (AutoAI Tool Documentation)*

GITHUB LINK

<https://github.com/durgareddy225/IBM-EdunetFoundation-Project>

IBM CERTIFICATIONS

In recognition of the commitment to achieve
professional excellence



Durga Reddy Karri

Has successfully satisfied the requirements for:

Getting Started with Artificial Intelligence



Issued on: Jul 16, 2025
Issued by: IBM SkillsBuild

Verify: <https://www.credly.com/badges/55abc15c-665d-48d1-85f0-87cae0e34a55>



IBM CERTIFICATIONS

In recognition of the commitment to achieve
professional excellence



Durga Reddy Karri

Has successfully satisfied the requirements for:

Journey to Cloud: Envisioning Your Solution



Issued on: Jul 19, 2025
Issued by: IBM SkillsBuild

Verify: <https://www.credly.com/badges/9d94f5d0-6a59-4675-88ed-ad693765f42b>



IBM CERTIFICATIONS

IBM **SkillsBuild**

Completion Certificate



This certificate is presented to

Durga Reddy Karri

for the completion of

**Lab: Retrieval Augmented Generation with
LangChain**

(ALM-COURSE_3824998)

According to the Adobe Learning Manager system of record

Completion date: 01 Aug 2025 (GMT)

Learning hours: 20 mins



THANK YOU