CAPSTONE PROJECT

TELE-LAW CASES

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OUTLINE

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PROBLEM STATEMENT

Despite the expansion of the Tele-Law initiative across states and districts, there is limited understanding of demographic utilization patterns and regional disparities in legal aid access. The challenge is to analyze Tele-Law case registration data to uncover gender-wise, caste-wise, and geographic disparities in service utilization across CSCs. Uneven representation among marginalized groups (SC, ST, OBC) and low outreach in certain districts raise concerns about equity and effectiveness. Moreover, the varying number of CSCs per region complicates direct comparisons. This problem demands a data-driven approach to evaluate inclusivity and optimize service delivery.

PROPOSED SOLUTION

Objective:

- To analyze Tele-Law data from 2021–2025 to identify and address:
- Gender-based, caste-based, and regional disparities
- Underutilization of Common Service Centres (CSCs)
- Areas with low outreach or marginalized group access

Proposed Solution Steps:

- Data Ingestion
- Import district-wise Tele-Law data from data.gov.in into IBM Watson Studio for analysis.
- Data Cleaning & Preparation
- Standardize gender, caste, and district entries
- Normalize case counts using number of CSCs
- Visualize trends by gender, caste, state, and CSC usage
- Compare “Advice Enabled” vs “Case Registered”
- Clustering of Districts
- Identify underserved districts and marginalized communities
- Suggest targeted interventions and outreach

Technologies Used:

- IBM Cloud Lite: Watson Studio, Object Storage

SYSTEM APPROACH

1. System Requirements

Hardware:

Device with internet access (laptop/desktop)

Minimum 4 GB RAM recommended for running notebooks smoothly

Cloud Platform:

IBM Cloud (Lite Plan)

IBM Watson Studio

IBM Cloud Object Storage

Environment:

Jupyter Lab (hosted via IBM Watson Studio)

2. Python Libraries Required

These libraries were used in the project to perform data analysis, visualization, and clustering:

import pandas as pd (Data manipulation)

import numpy as np (Numerical computations)

import matplotlib.pyplot as plt (Plotting)

import seaborn as sns (Advanced visualizations)

from sklearn.cluster import KMeans (Clustering)

ALGORITHM & DEPLOYMENT

Algorithm Selection:

- We used KMeans Clustering, an unsupervised learning algorithm, to group districts based on similarities in Tele-Law service utilization. This approach helps reveal hidden patterns and classify regions into low, medium, and high utilization categories.
- Key features used for clustering: Case Registered, Advice Enabled, Number of CSCs, Cases per CSC (derived for normalization)
- These features capture both service volume and infrastructure presence.

Training Process:

- Since KMeans is unsupervised, it doesn't require labeled data. We:
- Standardized the input features
- Used the Elbow Method to choose 3 clusters
- Trained the model to group similar districts

Prediction Process:

- The model assigned each district to a cluster:
- Cluster 0: Low usage
- Cluster 1: Medium usage
- Cluster 2: High usage
- These clusters were later analyzed to identify disparities in service access and suggest improvements.

RESULT

Districts were successfully clustered into three groups based on Tele-Law utilization:

High utilization: Strong case registration and advice delivery

Medium utilization: Moderate access with room for improvement

Low utilization: Underperforming regions requiring targeted outreach

Disparities observed:

Lower outreach in tribal and remote districts

Gender and caste-based gaps in service access, with underrepresentation of SC/ST and women in some regions

Normalization via "Cases per CSC" allowed fair comparison across districts with different infrastructure levels.

CONCLUSION

The analysis highlights significant regional and demographic disparities in the usage of the Tele-Law initiative. While some districts demonstrate strong performance, others lag due to infrastructural, social, or geographical constraints.

Using a data-driven approach, the project offers a foundation to:

Identify low-performing regions

Allocate resources more effectively

Promote inclusive legal access across all communities

FUTURE SCOPE

1. Real-time dashboards using IBM Cognos or Streamlit to monitor ongoing performance
2. Integration of demographic datasets (literacy rate, income level) to deepen the analysis
3. Predictive modeling to forecast future demand in each district
4. AI-based recommendation system to guide deployment of CSCs and legal advisors

REFERENCES

Tele-Law Dataset:

[District-wise Tele-Law Case Registration and Advice Enabled (FY 2021-22 to 2024-25)]

https://www.data.gov.in/resource/district-wise-tele-law-case-registration-and-advice-enabled-data-fy-2021-22-2024-25

IBM Cloud Documentation

IBM Watson Studio and IBM Cloud Object Storage.

Pandas and Matplotlib

Official Python libraries used for data handling and visualization

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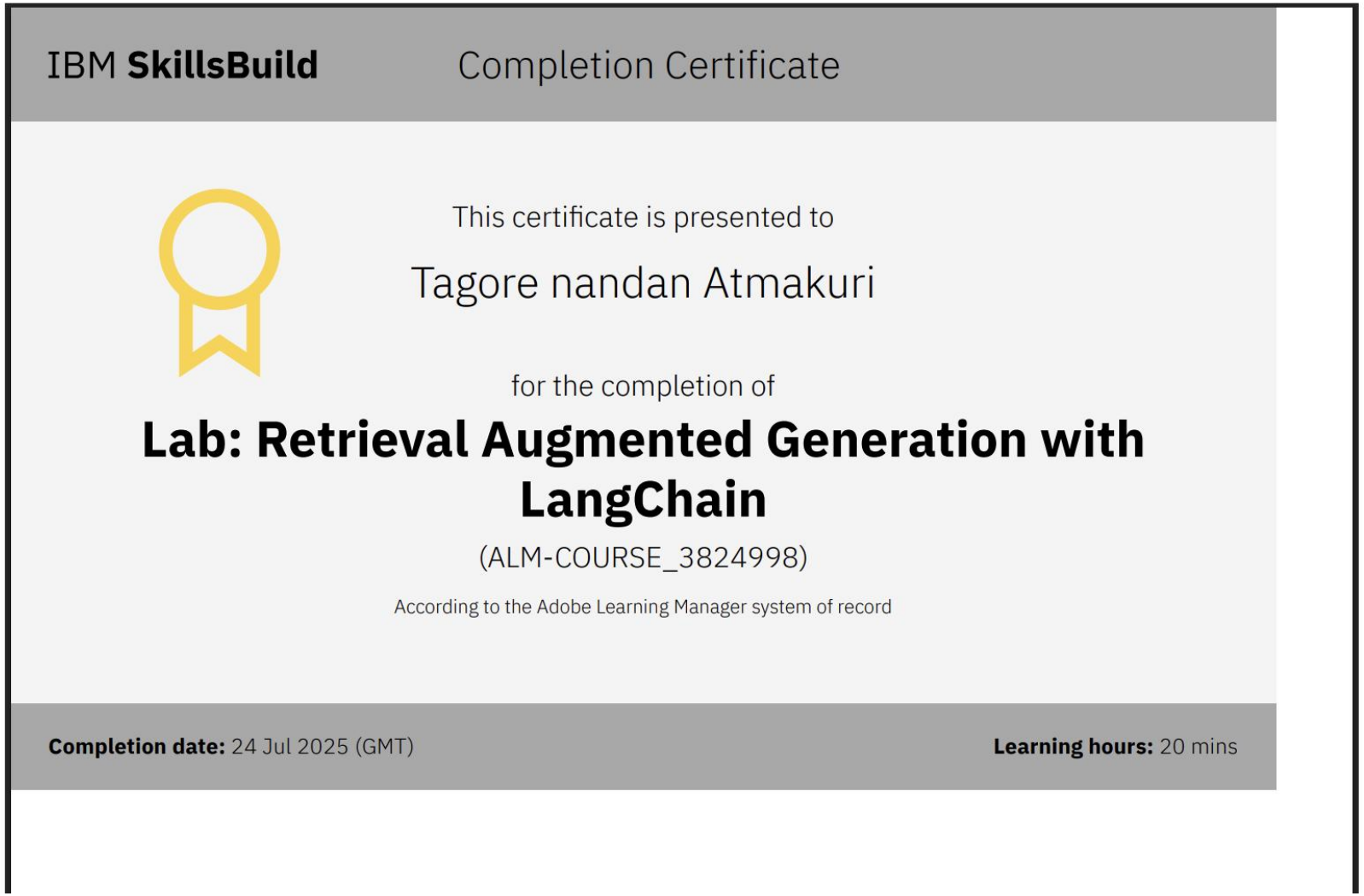

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