

HR Analytics – Predicting Employee Attrition

Internship Report

Submitted by: Amrith M Nair\ **Internship Company:** Elevate Labs\ **Internship Duration:** June 20 – June 25, 2025

1. Introduction

This report presents a mini-project carried out as part of an internship at Elevate Labs. The objective was to explore and analyze employee attrition trends using HR data, build a predictive model, and visualize key findings in Power BI.

2. Objective

The primary objective of this project is to use data analytics and machine learning techniques to:

- Predict employee attrition.
 - Understand the most influential factors driving attrition.
 - Visualize attrition trends using Power BI.
 - Recommend strategies to reduce future attrition.
-

3. Tools and Technologies Used

- **Python:** For data preprocessing, model building (Pandas, Seaborn, Sklearn).
 - **Power BI:** For interactive dashboards and data visualization.
 - **Jupyter Notebook:** For exploratory data analysis and scripting.
-

4. Dataset Overview

- Total Records: 1470
 - Key Columns: Attrition, MonthlyIncome, Age, Gender, Department, Job Role, MaritalStatus, YearsAtCompany, YearsSinceLastPromotion
 - The dataset was cleaned, missing values were imputed, and categorical variables were label encoded.
-

5. Exploratory Data Analysis

Several analyses were performed to understand patterns in employee attrition:

- Attrition by Department
- Attrition by Job Role
- Monthly Income vs Attrition
- Attrition by Age Group

- Attrition by Marital Status
- Attrition by Years Since Last Promotion

6. Model Building

A Logistic Regression model was used to predict attrition.

- **Accuracy:** 87.7%

Confusion Matrix:

```
[[234   3]
 [ 32  16]]
```

Classification Report:

	precision	recall	f1-score	support
0	0.88	0.99	0.93	237
1	0.84	0.33	0.48	48
accuracy			0.88	285
macro avg	0.86	0.66	0.70	285
weighted avg	0.87	0.88	0.85	285

7. Power BI Dashboard

The Power BI dashboard includes:

- KPI Cards: Total Attritions, Total Employees, Average Income, Attrition Rate
- Column/Bar Charts:
 - Monthly Income vs Attrition
 - Department-wise Attrition
 - Attrition by Job Role
 - Attrition by Age Group
 - Attrition by Marital Status
 - Attrition by Years Since Last Promotion
- Pie Chart: Gender-wise Attrition

[Dashboard Screenshot inserted here]

8. Key Insights

- Most attritions occur in the Sales and Research departments.
- Employees with low monthly income are more likely to resign.

- Males have slightly higher attrition than females.
 - Single employees and those who have not been promoted recently are at higher risk.
-

9. Suggestions to Reduce Attrition

- Offer timely promotions to deserving employees.
 - Focus on improving job satisfaction in high-risk departments.
 - Consider financial incentives for employees in lower salary bands.
 - Implement employee engagement and feedback programs.
-

10. Conclusion

The HR Analytics project successfully applied data science techniques to identify the key drivers of attrition. The predictive model and interactive dashboard offer valuable insights to HR teams for improving retention strategies.

11. References

- scikit-learn documentation
 - Power BI documentation
 - HR Analytics public datasets
-

End of Report