Introduction

Employee attrition is a critical issue faced by HR departments across industries. This project focuses on analyzing HR data to uncover the primary causes behind employee resignation and to build a predictive model that identifies potential attrition risks.

Abstract

The goal of the HR Analytics project was to explore patterns of employee attrition and develop a predictive model. Using Python for data processing and modeling, and Power BI for interactive dashboards, we analyzed various attributes like department, job role, age, income, and overtime. SHAP values were used to interpret model outcomes and provide transparency.

Tools Used

- Python (Pandas, Seaborn)
- Power BI
- Scikit-learn (Sklearn)

Steps Involved in Building the Project

1. Data Preprocessing: Cleaned and structured HR data for analysis.
2. Exploratory Data Analysis (EDA): Visualized attrition trends by department, income range, job role, age group, etc.
3. Modeling: Built classification models using Logistic Regression and Decision Tree to predict employee attrition.
4. SHAP Analysis: Applied SHAP values to interpret the impact of features on model predictions.
5. Visualization: Created dashboards in Power BI to display key insights.

Conclusion

The project successfully identified key drivers of employee attrition, such as overtime, salary range, and age group. Predictive modeling achieved high accuracy, and SHAP values enhanced model interpretability. This solution empowers HR teams to take proactive steps toward employee retention

and strategic workforce planning.