HR Analytics - Predict Employee Attrition

# Introduction

Employee attrition, the gradual loss of employees over time, is a key challenge for organizations. Predictive analytics can help HR departments identify key factors influencing attrition and take preventive actions.

# Abstract

This project aims to analyze employee data to understand trends and drivers of attrition using Python for modeling and Power BI for interactive visualization. A classification model is developed to predict attrition and explain predictions using SHAP values.

# Tools Used

• Python (Pandas, Seaborn, Sklearn)

• Power BI

• Jupyter Notebook

• SHAP for model explainability

# Steps Involved in Building the Project

1. Data Cleaning and Preprocessing: Handled missing values and encoded categorical variables.  
2. Exploratory Data Analysis: Analyzed attrition trends by age, department, and job role using Seaborn.  
3. Model Building: Implemented Logistic Regression and Decision Tree classifiers.  
4. Model Evaluation: Evaluated using accuracy, precision, recall, and confusion matrix.  
5. SHAP Analysis: Explained feature importance for individual predictions.  
6. Power BI Dashboard: Created visualizations highlighting attrition rates and potential risk areas.

# Conclusion

Through detailed analysis and modeling, the project identified key drivers of attrition such as job satisfaction, work-life balance, and promotions. The classification model aids HR teams in proactively retaining employees. Power BI dashboards further enhance interpretability for decision-makers.