HR Analytics- Prediction of Employee Attrition

Objective : The primary goal of this project is to analyze employee data to understand factors that influence employee attrition — the departure of employees from an organization.

The analysis aims to :

Uncover hidden patterns and correlations in HR data.

Build predictive models to forecast which employees are likely to leave.

Abstract :

This project focuses on predicting employee attrition using HR analytics. The dataset includes features like age, job role, income, and satisfaction levels, with attrition as the target variable. Exploratory Data Analysis identified key patterns such as high attrition among younger, lower-paid, and less-satisfied employees. Data preprocessing involved encoding categorical variables and balancing classes using SMOTE. Two models were implemented—Decision Tree and Random Forest—with Random Forest achieving 91% accuracy. The results offer actionable insights to help organizations improve retention and workforce planning.

Presented By: Mohammad Amil Khan

Project Steps

Data was imported and analyzed in **Jupyter Notebook** using Python for EDA, preprocessing, and model building.

SMOTE was applied to balance the dataset, followed by training and evaluating models like Decision Tree and Random Forest.

Power BI was used for creating interactive dashboards to visualize key attrition trends and insights for business stakeholders.

Conclusion

The analysis showed that younger employees with low income and job satisfaction are more prone to attrition.
Factors like overtime, limited growth, and low job involvement further increase the likelihood of leaving.
The Random Forest model achieved **91% accuracy**, offering strong precision and recall for both classes.
These insights and predictions can guide HR strategies to reduce turnover and improve retention.