

HR Analytics – Predicting Employee Attrition

Objective

This project analyzes HR data to identify key drivers of employee attrition and visualize patterns to support decision-making for improving employee retention.

Dataset

- **Source:** [IBM HR Analytics Attrition Dataset](#)
- **File Used:** WA_Fn-UseC_-HR-Employee-Attrition.csv
- **Fields include:** Age, Attrition, Department, MonthlyIncome, JobSatisfaction, OverTime, etc.

Tools Used

- Python (Pandas, Scikit-learn, SHAP for model & explainability)
- Power BI (For dashboard and visual insights)
- CSV Export (for transferring cleaned data to Power BI)

Project Workflow

1. Data Preprocessing
2. Modeling
3. Explainability
4. Dashboard

Power BI Dashboard Visuals

- Attrition by Department
- Income vs Attrition
- OverTime vs Attrition
- Attrition by Job Role
- Attrition by Age Group
- Job Satisfaction vs Attrition
- Department × OverTime Heatmap
- Gender × Education Field vs Attrition
- KPI Cards (Attrition Rate, Total Employees)
- Slicers: Gender, Age Group, Department, Job Role

Key Insights

- **OverTime** is the strongest predictor of attrition

- Employees with **low Job Satisfaction** are significantly more likely to leave
- **Sales** and **Human Resources** departments face higher attrition than R&D
- **Younger employees** (under 30) and **low-income earners** are most likely to leave
- There's an inverse relationship between **Monthly Income** and attrition likelihood

Conclusion

This project combines machine learning (logistic regression) with interpretability (SHAP) and business visualization (Power BI) to analyze and understand employee attrition. These insights help HR departments take proactive steps to retain valuable employees through improved working conditions, compensation, and job engagement.

HR Attrition Analysis Dashboard

Employee

915

Attrition Rate

174

Daily Rate

733K

Job Satisfaction

JobSatisfaction

1

3



Attrition

0

1



Education Field

EducationField

☐ Human Resources

☐ Life Sciences

☐ Marketing

☐ Medical

☐ Other

☐ Technical Degree

Gender

Gender

☐ Female

☐ Male

Age

Age

18

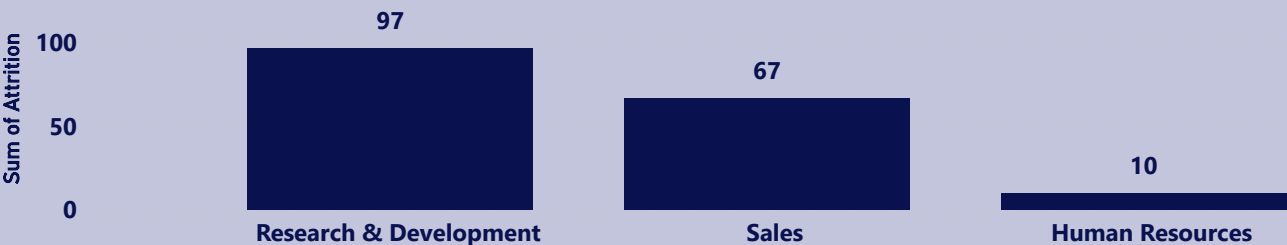
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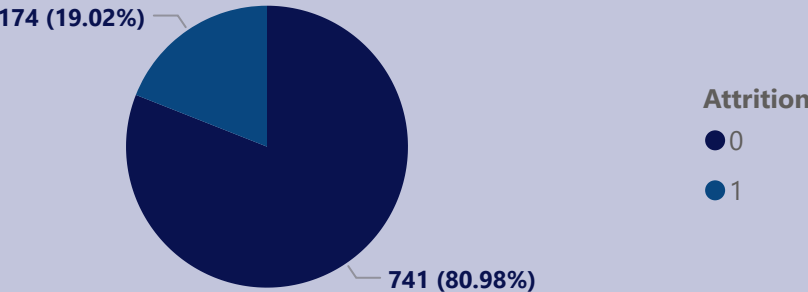
Monthly Income Distribution by Attrition



Attrition by Department



OverTime VS Attrition



Job Role vs Attrition

