

# **HR ANALYTICS PROJECT REPORT**

## **Predicting Employee Attrition**

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## 1. Executive Summary

Employee attrition impacts hiring cost and productivity. Using HR data (1,470 records), a Logistic Regression model was built to predict attrition (Yes/No). Class imbalance handled using SMOTE. Final model accuracy: 76.2%. SHAP analysis was applied to interpret predictions. This report provides insights and strategies to reduce attrition.

## 2. Dataset Snapshot

Dataset: WA\_Fn-UseC\_-HR-Employee-Attrition

Rows: 1,470

Target: Attrition (Yes/No)

Features: Age, BusinessTravel, Department, JobRole, MonthlyIncome, OverTime, Satisfaction scores, etc.

## 3. Key Drivers of Attrition

- OverTime = Yes → High attrition risk.
- BusinessTravel = Travel\_Frequently → Increases attrition probability.
- Low MonthlyIncome → Compensation dissatisfaction.
- Low JobSatisfaction / EnvironmentSatisfaction → Engagement issues.
- JobLevel (1–2) → Career growth concerns.

## 4. Recommendations

### A. Workload & Overtime

- Monitor and balance overtime.
- Provide compensatory time off.

### B. Travel Fatigue

- Reduce frequent travel, promote virtual meetings.

### C. Compensation

- Review pay structure for lower job levels.
- Introduce retention bonuses.

### D. Engagement

- Conduct quarterly satisfaction surveys.
- Create mentorship programs.

#### **E. Flexibility**

- Implement hybrid work options for long-distance employees.

### **5. Model Performance**

Algorithm: Logistic Regression (SMOTE balanced)

Test Accuracy: 76.2%

Metrics: Confusion Matrix, Classification Report

### **6. Conclusion**

Addressing workload, travel, compensation, and engagement gaps will significantly reduce attrition. Predictive analytics ensures proactive employee retention.