

HR ANALYTICS – PREDICTING EMPLOYEE ATTRITION

MODEL ACCURACY REPORT

Objective:

To predict which employees are likely to leave the organization using classification techniques and understand key attrition factors through data-driven analysis.

Model Overview:

- **Algorithm Used:** Decision Tree Classifier
- **Data Split:** 80% training, 20% testing
- **Target Variable:** Attrition (0 = No, 1 = Yes)
- **Test Set Size:** 441 employees

Performance Metrics:

Overall Accuracy: 84.58%

Confusion Matrix:

	Predicted: No Attrition (0)	Predicted: Attrition (1)
Actual: No (0)	361	19
Actual: Yes (1)	49	12

- ✓ True Positives (TP): 12
- ✓ True Negatives (TN): 361
- ✓ False Positives (FP): 19
- ✓ False Negatives (FN): 49

Classification Report:

Metric	No Attrition (0)	Attrition (1)
Precision	0.88	0.39
Recall	0.95	0.20
F1-score	0.91	0.26
Support	380	61

- Macro Average F1-score: 0.59
- Weighted Average F1-score: 0.82

Analysis & Insights:

- ❖ The model performs well for predicting employees who stay (class 0).
- ❖ Performance is weak for identifying those who will leave (class 1), with:
 - ✓ Low recall (20%) → many actual leavers go undetected.
 - ✓ Low F1-score (0.26) indicates poor balance between precision and recall for attrition.
- ❖ This is likely caused by class imbalance (only ~14% attrition cases).

Key Findings from Power BI Dashboard:

Department-Wise Attrition:

- Highest attrition occurs in Research & Development and Sales.
- Focus retention strategies on these departments with tailored support and management involvement.

Job Role Trends:

- Sales Executives and Laboratory Technicians experience the most attrition.

- These roles may suffer from repetitive tasks, performance pressure, or lack of career progression.

Salary Band Insight:

- Employees in the Medium salary band (around 49% of attrition) are most at risk.
- Indicates potential dissatisfaction despite average pay—consider improving benefits, work-life balance, and role enrichment.

Age Group Distribution:

- Employees aged 30–39 make up the majority of leavers (45.35%).
- Suggests that this group—likely mid-career professionals—may be seeking growth, flexibility, or purpose.

Attrition Prevention Strategies:

For Departments with High Attrition:

- Conduct exit interviews in R&D and Sales to identify recurring themes.
- Offer career mobility and project diversity to reduce stagnation.
- Implement targeted mentoring or leadership shadowing programs.

For Job Roles with High Risk:

- Evaluate workload, incentives, and growth paths for Sales Executives and Lab Technicians.
- Create role rotation programs or skill development pathways.

For Medium Salary Band Employees:

- Improve non-monetary benefits: remote work options, flexible hours, learning stipends.
- Ensure clear promotion criteria and recognize contributions publicly.

For Employees Aged 30–39:

- This group may be seeking meaningful work and career progression.
- Launch internal mobility programs and leadership pipelines.
- Promote work-life balance initiatives.