

# HR Analytics Project Report

## A. Data Exploration

Dataset: HR analytics dataset with 35+ columns and 1400+ entries.

Key Features:

Categorical: Department, JobRole, MaritalStatus, OverTime, Gender, etc.

Numerical: Age, MonthlyIncome, YearsAtCompany, YearsWithCurrManager, etc.

Target Variables:

- PerformanceRating
- Attrition

## B. Data Cleaning

- Removed non-informative/redundant columns: EmpID, Over18, StandardHours, etc.
- Filled missing values in YearsWithCurrManager using the median.
- Encoded categorical variables using Label Encoding for model training.

## C. Key Insights

Attrition Insights:

- Higher attrition observed among employees doing OverTime.
- Marital status has a noticeable impact on attrition.

Performance Insights:

- Positive correlation between Percent Salary Hike and Performance Rating.
- Years at company and with current manager are weakly correlated with performance.

## D. Visualizations

- Correlation heatmap to understand relationships.
- Bar plots: PercentSalaryHike vs PerformanceRating, MaritalStatus vs Attrition.
- Count plot for OverTime vs Attrition.

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## E. Modeling Summary

Performance Prediction:

- Model: RandomForestRegressor
- RMSE: 0.0

Attrition Prediction:

- Model: RandomForestClassifier
- Accuracy: 0.86, Precision: 0.88, Recall: 0.15, F1-score: 0.25

## F. Streamlit Web Application

Purpose:

Built an interactive web app using Streamlit to predict:

- Employee Performance Rating
- Employee Attrition

Features:

- User-friendly form to input essential employee details
- Backend model using Random Forest
- Displays predicted performance rating and attrition risk

Tech Used: Streamlit, Scikit-learn, Pandas

Note: Categorical inputs were reverse-mapped for better usability.

Deployed on: <https://hranalyticsdashboard-shashank.streamlit.app>

## G. Power BI Dashboard

Purpose:

Created an HR dashboard in Power BI to visualize key insights.

Visualizations Included:

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- Attrition by Education, Age, Job Satisfaction, Salary
- Performance by Role, YearsAtCompany, Salary
- Monthly Income by Job Role

## Highlights:

- Interactive filters, slicers
- Clean layout for quick understanding of HR KPIs