

## Objective

To reduce employee attrition by addressing key risk factors identified through SHAP analysis and model insights.

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## SHAP Analysis Summary

SHAP (SHapley Additive Explanations) was used to identify the top features influencing employee attrition. The most impactful attributes were:

- YearsInCurrentRole
- YearsAtCompany
- YearsSinceLastPromotion
- TotalWorkingYears
- YearsWithCurrManager

These features indicate that employee stagnation, lack of promotion, and long tenure in the same role/team are major contributors to attrition.

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## Key Risk Factors Identified:

### 1. Work-Life Balance

- Employees with poor work-life balance showed significantly higher attrition.
- Many high-risk individuals had lower scores in EnvironmentSatisfaction and WorkLifeBalance.

Recommendation:

- Introduce flexible work hours or hybrid work policies.

- Encourage mandatory time-off and set work-life boundaries.
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## **2. Compensation and Salary Hike**

- Monthly income and percent salary hike were influential in predicting attrition.

Recommendation:

- Implement transparent performance-based raise mechanisms.
  - Benchmark salaries against industry standards annually.
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## **3. Career Growth**

- Long duration in the same role without promotion strongly correlates with resignation.

Recommendation:

- Create mentorship and upskilling programs.
  - Review promotion eligibility and timing more frequently.
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## **4. Job Satisfaction and Engagement**

- Low JobSatisfaction and JobInvolvement lead to increased attrition.

Recommendation:

- Conduct engagement surveys quarterly.
  - Launch employee recognition and feedback systems.
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## 5. OverTime and Burnout

- "OverTime" was one of the most impactful SHAP features.

Recommendation:

- Monitor workload using dashboards.
- Enforce overtime caps and support recovery time.

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## Suggested KPIs to Monitor in Power BI

- Attrition rate by department
- Average years in current role
- Time since last promotion
- Manager tenure vs. team attrition
- Prediction probability heatmap

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## Conclusion

The SHAP-based analysis revealed that attrition is largely driven by lack of growth, engagement, and recognition. A data-driven HR strategy can reduce attrition by implementing timely promotions, flexible policies, and targeted development programs.

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This report is part of the HR Analytics Project using Python, Power BI, and SHAP.