

</ PSTB Hackathon 1 - Subject 3: Employee Attrition @ IBM >

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Exploring Employee Attrition @ IBM

>> Uncovering patterns and correlations to better understand causes of employee turnover within the IBM corporate environment.

With this analysis we are particularly looking at:

- Main factors driving employee attrition & which groups are most at risk?
- Demographic and job-related characteristics influencing attrition
- Identifying patterns or early indicators of attrition to enable proactive intervention
- How is employees' satisfaction and work-life balance impacting attrition rates?
- Actionable strategies that management can implement to reduce turnover

Stack

Tools used

- VS Code
- Github
 - Branches: Main, DEV_YACINE & DEV_CLEMENT
- Google Colab
- Python 3.12.12
- Slack

Features list

- Data Loading
- Data Preprocessing
- Exploratory Data Analysis (EDA)
- Correlation and Trend Analysis
- Visualizations (matplotlib & seaborn)
- Retention Strategy Development

Difficulties you managed to overcome

- Git issues (managing conflicts when merging)
- Virtual environment issue on VS Code (ipykernel config)
- Time management
- Splitting tasks while maintaining one central code

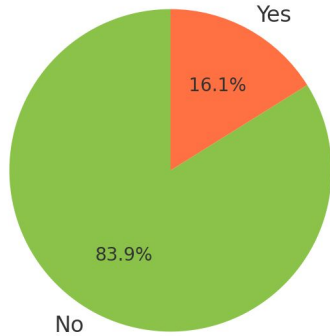
What you are proud of during this hackathon (features or management)

- Strong collaboration
- Structuration of final deliveries
- Completing the project on time

QUICK ANALYSIS OVERVIEW

Attrition Overview

Overall Attrition Rate



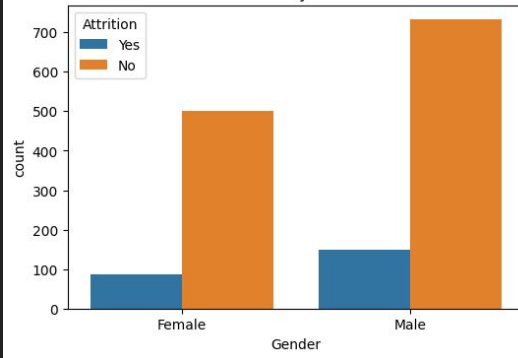
→ Overall attrition is around 16%, a high level compared to average turnover across all US industries (3.3%*)

→ Male attrition is slightly higher

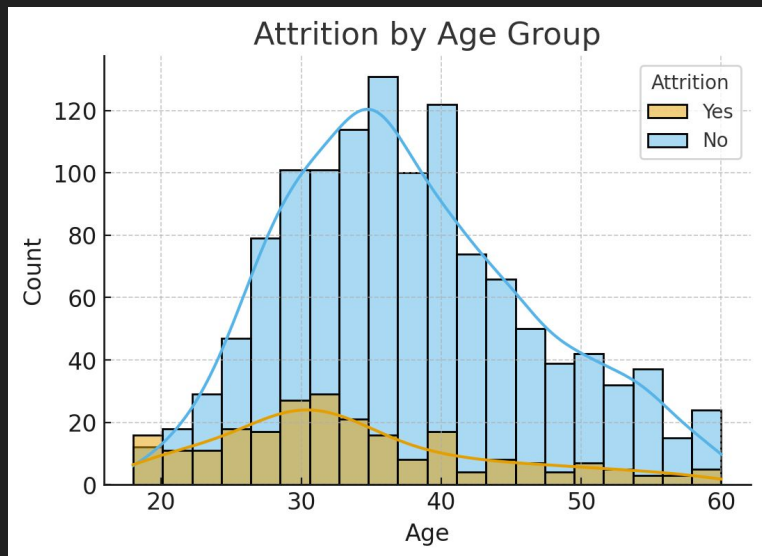
→ Each percentage point represents significant replacement and training costs.

→ Goal: identify groups driving attrition and address root causes.

Attrition by Gender

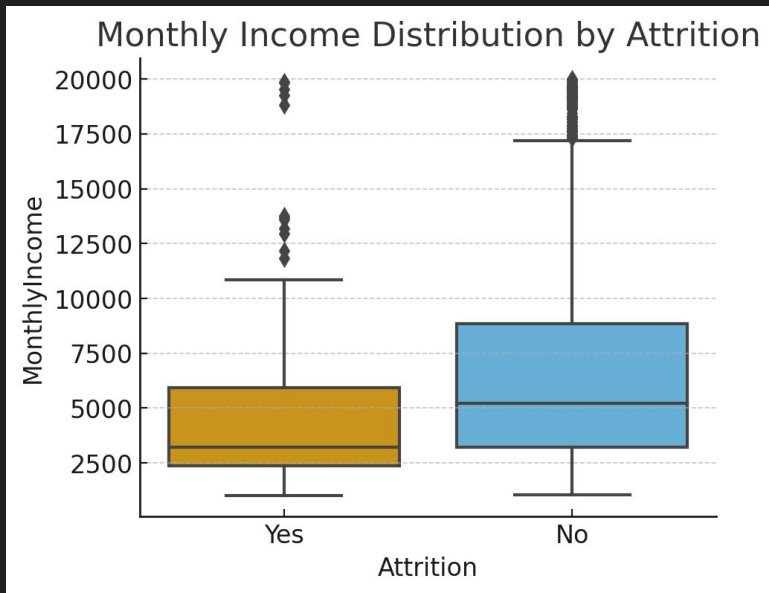


Attrition by Age



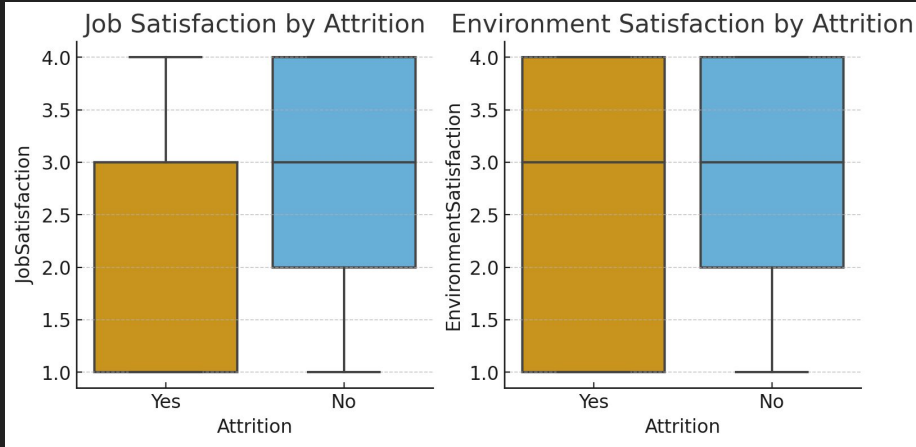
- Younger employees (<35) show the highest attrition rates.
- Mid-career employees are more stable; attrition drops after 40.
- Early-career support and development can reduce early exits.

Monthly Income vs Attrition



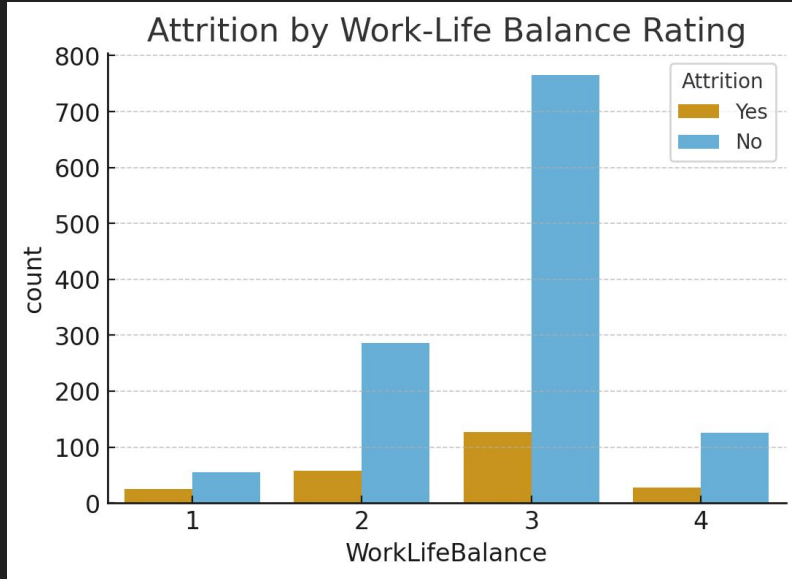
- Employees who left have lower incomes than those who stayed.
- Compensation fairness and career growth affect retention.
- Satisfaction is probably a stronger predictor than income alone.

Satisfaction vs Attrition



- Low Job and Environment Satisfaction strongly predict attrition.
- Employees rating <3 are 2–3x more likely to leave.
- Improving engagement, recognition, and management quality is key.

Work-Life Balance vs Attrition



- Poor work-life balance correlates with highest attrition rates.
- Burnout and overtime are key risk factors.
- Flexible work and balanced workloads improve retention.

Strategic takeaways

1. Improve Job Satisfaction and Career Development
2. Enhance Work-Life Balance and Reduce Burnout
3. Strengthen Employee Engagement and Environment Satisfaction
4. Focus on High-Risk Demographics and Roles
5. Address Compensation and Growth Perception
6. Build a Predictive Attrition Monitoring System

That's all folks !