HUMAN RESOURCES DATASET ANALYSIS

Behind the Numbers: What HR Data Tells Us About People and Performance

Project Overview

Gain insights into:

- Employee performance
- Employee satisfaction
- Attrition rates
- Identify key factors influencing employee turnover
- Determine which departments and job roles are more affected by turnover
- Asses the impact of : education,financial benefits, managerial level on salaries and promotions
- Investigate the relationship between work-life balance ,travel frequency, employee retention
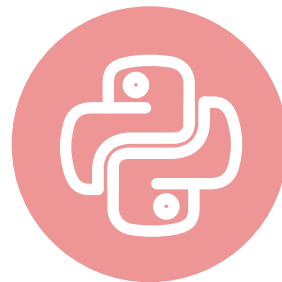- Performance gaps assessment

Tools used

Python

- Data Loading – Imported multiple HR-related datasets.
- Data Cleaning – Checked for missing values and inconsistencies.
- Data Merging – Combined datasets for unified analysis.
- Exploratory Analysis – Visualized trends and key metrics.
- Insight Generation – Identified patterns in performance and satisfaction.

Microsoft Excel

Microsoft Excel was employed for preliminary data examination, including filtering and pivot table generation.
Employed Excel's filtering and sorting tools to isolate specific employee groups and performance metrics for targeted review

Tableau

Tableau was subsequently used to develop interactive dashboards and data visualizations, facilitating clear and effective communication of key insights to stakeholders.
Built interactive dashboards to visualize trends in employee satisfaction, performance ratings, and demographic distributions.
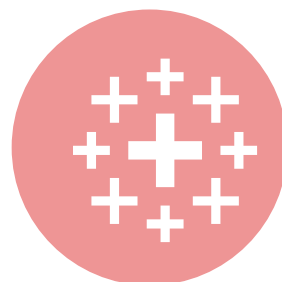
Google Meet

We used Google Meet to discuss the work details and planning. During the meeting, we agreed on the required tasks and assigned roles accordingly.
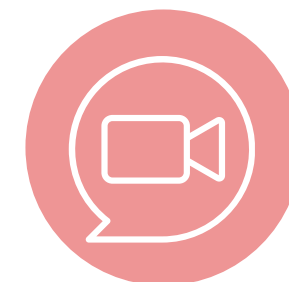
Section 1: Promotion, Tenure & Talent Development

Promotion Indicators:

1. The most influential factors for promotion include:
   - Years with the company.
   - Time spent in the current role.
   - Length of relationship with the current manager.
2. Interestingly, education level has shown a weak correlation with promotion or salary growth, indicating that tenure and managerial continuity carry more weight in career progression.

Tenure Insights:

1. Tableau dashboards reveal a significant drop in employee retention within the first 12 to 24 months of employment.
2. This early stage represents a strategic window for HR to focus on:
   - Strong onboarding programs.
   - Continuous managerial and developmental support.
   - Cultivating organizational belonging from the start.

Section 2: Employee Turnover Analysis

Current Turnover Rate:
The company's current turnover rate stands at 16.7%, which is moderate. While not alarming, it highlights significant opportunities for improving talent retention—particularly during the early stages of employment.

Key Drivers of Attrition:

1. Length of Tenure: The majority of resignations occur within the first two years, indicating a critical need for more structured onboarding and engagement during this period.
2. Managerial Continuity: Employees with stable reporting lines report higher satisfaction and are more likely to stay. Frequent changes in direct managers are linked to disengagement and exits.
3. Work-Life Balance: Employees citing poor balance between their professional and personal lives are more likely to leave the organization.
4. Business Travel: Roles requiring frequent travel show a strong correlation with higher turnover, particularly in technical or operational positions.

Departments & Roles Most Affected:

1. The Research & Development department, particularly roles like Lab Technicians, show the highest attrition rates.
2. These same areas report low satisfaction levels, as confirmed through Tableau dashboards.

Section 3: Compensation & Equity Analysis

Salary Trends:

1. The current average salary is approximately $61,443.50 per year.
2. It is projected to increase to $62,039.60 next year based on regression modeling.
3. This gradual rise aligns with increased tenure and professional experience.

Departmental and Demographic Differences:

1. The Finance and HR departments show the highest salary averages.
2. There is a strong positive correlation between salary and years of experience.
3. A notable gender pay gap exists, with men earning more on average, highlighting a need for equity-focused salary reviews.

Section 4: Predictive Hiring & Workforce Planning

Forecasted Hiring Needs (via predictive modeling):

1. Research & Development (R&D): 12 projected hires
2. Sales Department: 9 projected hires
3. HR Department: 6 projected hires

Value of Data-Driven Planning:

- These projections offer a precise roadmap for HR teams to align hiring strategies with future business needs.
- Leveraging predictive insights helps:
  - Avoid understaffing.
  - Prevent overhiring.
  - Enhance agility and team performance.

Insights and strategic recommendations

Section 5: Employee Satisfaction & Performance Alignment

Key Observations:

1. Employees who report higher job satisfaction tend to achieve stronger performance ratings, reinforcing the link between engagement and productivity.
2. Tableau dashboards reveal distinct satisfaction gaps across specific departments, which directly impact overall performance and morale.

Manager-Employee Dynamics:

1. A long-term, positive relationship with a direct manager is a critical driver of employee satisfaction and retention.
2. There is a consistent discrepancy between employee self-assessments and manager evaluations, with managers generally adopting a more conservative stance.

Impact of Training & Development:

1. Employees who received training within the past year:
   - Reported higher job satisfaction.
   - Were more likely to be promoted or shifted to more impactful roles.

Improve new hire retention

- Launch a comprehensive onboarding and mentorship program covering the first 24 months.
- Include regular check-ins and milestone reviews.

Link training to promotion

- Design structured learning paths tied to promotion eligibility.
- Communicate how training supports career advancement.

Enhance satisfaction in high-risk departments

- TDeploy quarterly employee satisfaction surveys.
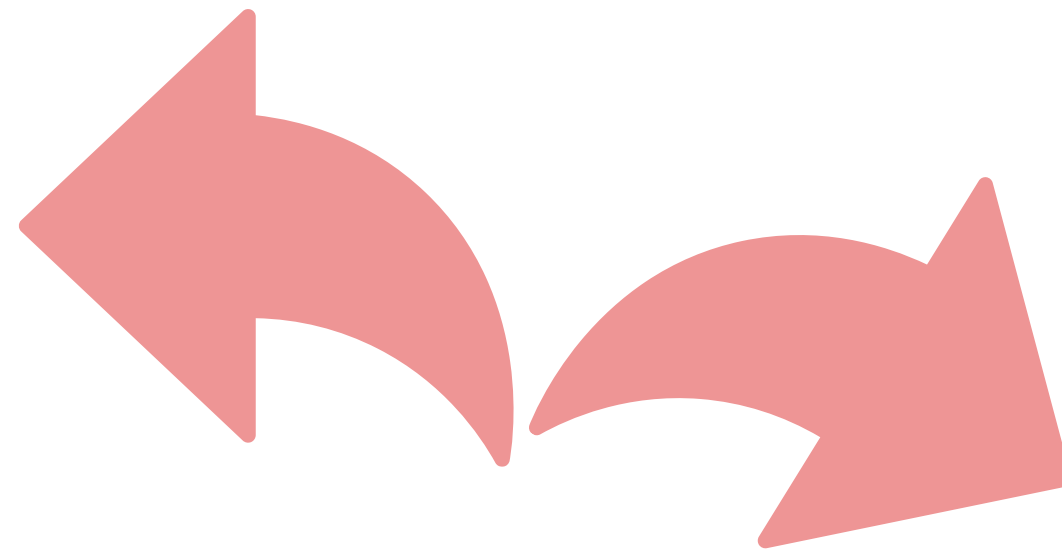- Conduct standardized exit interviews for data-driven insights.

Improve performance evaluation systems

- Implement 360-degree performance feedback.
- Provide training to managers on fair and effective evaluations.
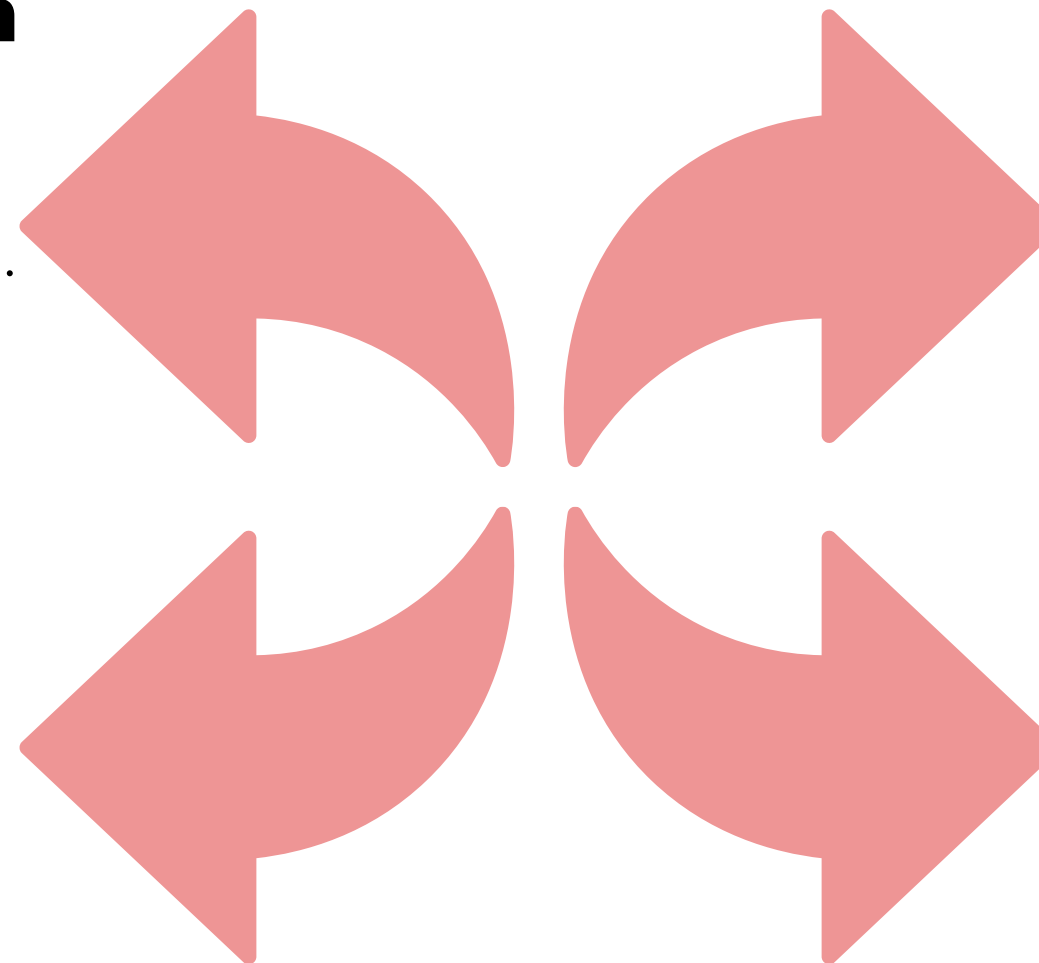
Ensure compensation fairness

- Conduct biannual salary audits.
- Monitor and address gender or departmental pay gaps.

Promote managerial stability

- Minimize frequent manager changes for employees.
- Monitor the employee-manager relationship as a retention factor.

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THANK
YOU

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