

HR Analytics – Employee Attrition Analysis

(using SQL and Power BI)

Project Report

1. Introduction

Employee attrition is a major challenge for organizations as it directly impacts productivity, hiring costs, and team stability. This project focuses on analysing HR data to identify attrition patterns and key factors influencing employee turnover using data analytics tools.

2. Business Objective

The objective of this project is to:

- Analyse employee attrition trends
 - Identify high-risk departments and job roles
 - Understand the impact of salary, experience, and satisfaction on attrition
 - Provide data-driven insights to improve employee retention
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3. Dataset Overview

- Dataset Type: HR Employee Dataset
 - Total Records: ~1,470 employees
 - Key Columns:
 - Employee Number
 - Age
 - Gender
 - Marital Status
 - Attrition
 - Department
 - Job Role
 - Job Satisfaction
 - Job Level
 - Business Travel
 - Distance From Home
 - Salary
 - Over Time
 - Environment Satisfaction
 - Total Working Years
 - Work Life Balance
 - Years At Company
 - Years Since Last Promotion
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4. Tools Used

- **SQL** – Data extraction, filtering, and aggregation
 - **Power BI** – Data modelling, DAX, and dashboard creation
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5. KPI Definitions

- **Total Employees** – Count of active employees
 - **Total Attrition** – Number of employees who left the company
 - **Attrition Rate (%)** – $(\text{Total Attrition} / \text{Total Employees}) \times 100$
 - **Average Salary** – Mean monthly income of employees
 - **Average Years at Company** – Average employee tenure
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6. Power BI Dashboard

An interactive Power BI dashboard was created to visualize:

- Overall attrition rate
- Attrition by department, job role, and gender
- Salary comparison by attrition status
- Attrition trends by years at company
- Work-life balance vs attrition

(Slicers used: Gender, Department, Job Role)

7. Key Insights

- Overall attrition rate is ~16%
 - Research & Development department shows the highest attrition
 - Employees with lower salary levels are more likely to leave
 - Low job satisfaction and poor work-life balance increase attrition
 - Most attrition occurs within the first 5 years of employment
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8. Business Recommendations

- Improve compensation structure for low-salary job roles
 - Focus retention efforts on employees with low satisfaction scores
 - Enhance work-life balance policies
 - Introduce engagement programs for employees in early tenure
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9. Business Insights

Workforce Overview

- Total Employees: 1470
- Active Employees: 1233 (83.88%)
- Employees Left: 237
- Attrition Rate: 16.12%

Insight: Attrition rate above 15% indicates a moderate retention risk.

Department-wise Attrition

- Research & Development: 133 (highest)
- Sales: 92
- Human Resources: 12 (lowest)

Insight: Large departments show higher attrition due to workforce size and job pressure.

Job Role-wise Attrition

Top attrition roles:

1. Laboratory Technician – 62
2. Sales Executive – 57
3. Research Scientist – 47

Insight: Operational and customer-facing roles experience higher turnover.

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Salary & Attrition

- Avg Salary (Attrition = Yes): ₹4,787
- Avg Salary (Attrition = No): ₹6,833

Insight: Lower salary is strongly linked to higher attrition.

Overtime Impact

- Overtime = Yes → 127
- Overtime = No → 110

Insight: Employees working overtime are more likely to leave.

Work-Life Balance

- Balance level 3 → highest attrition (127)
- Poor balance (1 & 2) also shows risk

Insight: Work-life balance significantly affects retention.

Years at Company

- Highest attrition in 0–3 years
- Attrition drops significantly after 5 years

Insight: Early tenure employees are most at risk.

Promotion Gap

- Employees with 0 years since last promotion show highest attrition (110)

Insight: Lack of career growth increases attrition.

Gender Insights

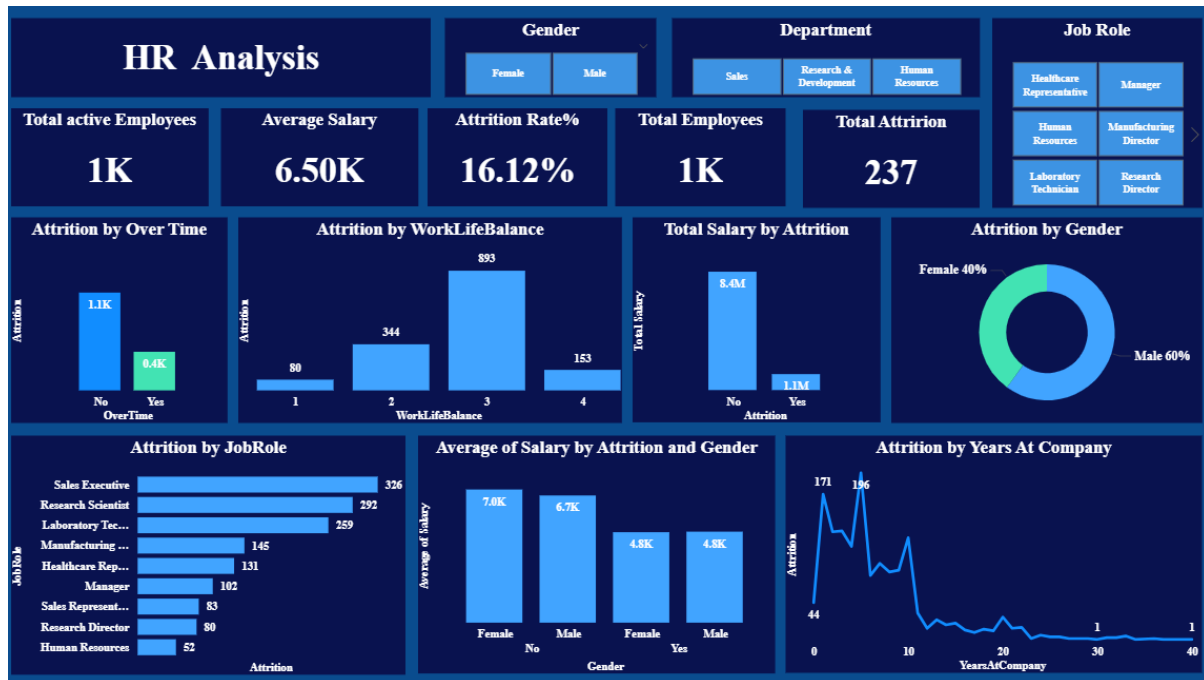
- Male attrition: 150
- Female attrition: 87

Insight: Male employees show higher attrition in this dataset.

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Dashboard view:



10. Conclusion

This HR Analytics project demonstrates how data analysis can help organizations identify attrition drivers and improve employee retention strategies. Using SQL and Power BI, meaningful insights were derived to support HR decision-making.