

# **Report of DA Program 2024**

## ***“Employee Attrition Analysis and Prediction Dashboard”***

**Technocolabs softwares Inc.**



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# Introduction:

Employee attrition poses a critical challenge for organizations worldwide, impacting team cohesion, project stability, and overall company performance. Acme Corporation, a prominent tech company, is no exception to this trend. The increasing rate of employee turnover within Acme has raised alarms within the HR department, prompting the need for a data-driven solution to address this pressing issue.

In response to the escalating attrition rates, Acme Corporation aims to leverage the power of data analytics and machine learning to gain deeper insights into the factors contributing to employee turnover. By understanding the underlying reasons behind employee departures, Acme seeks to develop proactive strategies to retain valuable talent and mitigate the negative repercussions associated with attrition.

This project endeavors to analyze historical employee data, including demographic information, job-related attributes, performance metrics, and feedback, to uncover patterns and correlations indicative of impending attrition. By proactively identifying individuals susceptible to attrition, Acme Corporation can tailor targeted retention initiatives, such as personalized career development plans, improved work-life balance measures, and recognition programs, to mitigate turnover and foster a more conducive work environment.

Overall, this project represents a proactive approach by Acme Corporation to address the challenge of employee attrition, emphasizing the integration of data analytics and machine learning to inform strategic HR decisions and promote long-term organizational sustainability.

- **Problem statement:**

Acme Corporation, a leading tech company, is facing a significant challenge with employee turnover. The HR department is concerned about the increasing rate of attrition, as it negatively impacts team dynamics, project continuity, and overall company morale. To address this issue, Acme Corporation wants to leverage data analytics and machine learning to

understand the factors influencing employee turnover and predict which employees are likely to leave in the near future.

- **Objectives:**

1. Understand the Factors Contributing to Employee Attrition
2. Analyze historical data to discover and understand multiple factors that influence employee turnover at Acme Corporation. These characteristics may include demographics, job satisfaction, compensation, work-life balance, performance ratings, and career growth opportunities and so on.

- **Attributes:**

- Age: The age of the employee.
- Attrition: A binary variable indicating whether the employee has left the company (1) or is still employed (0).
- Business Travel: The frequency and nature of business-related travel (e.g., "Travel\_Rarely," "Travel\_Frequently," "Non-Travel").
- Department: The department to which the employee belongs (e.g., "Sales," "Research & Development," "Human Resources").
- Distance From Home: The distance of the employee's residence from the workplace.
- Education: The employee's level of education (e.g., "1: 'Below College'," "2: 'College'," "3: 'Bachelor'," "4: 'Master'," "5: 'Doctor'").
- Education Field: The field in which the employee's education lies (e.g., "Life Sciences," "Medical," "Marketing").
- Environment Satisfaction: The level of satisfaction with the work environment on a scale.
- Gender: The gender of the employee.
- Job Involvement: The degree to which the employee is involved in their job.
- Job Level: The level or rank of the employee's position.
- Job Role: The specific role or title of the employee's job.

- Job Satisfaction: The level of satisfaction with the job on a scale.
- Marital Status: The marital status of the employee.
- Monthly Income: The monthly salary of the employee.
- Num Companies Worked: The number of companies the employee has worked for.
- Over Time: Whether the employee works overtime or not.
- Performance Rating: The performance rating of the employee.
- Relationship Satisfaction: The level of satisfaction with relationships at the workplace.
- Stock Option Level: The level of stock options provided to the employee.
- Total Working Years: The total number of years the employee has been working.
- Training Times Last Year: The number of training sessions the employee attended last year.
- Work-Life Balance: The balance between work and personal life.
- Years At Company: The number of years the employee has been with the current company.
- Years In Current Role: The number of years the employee has been in their current role.
- Years Since Last Promotion: The number of years since the last time the employee was promoted.
- Years With Current Manager: The number of years the employee has been working under the current manager.

# Methodology



- **Platform Used:** Power BI.

- **Data Importing:**

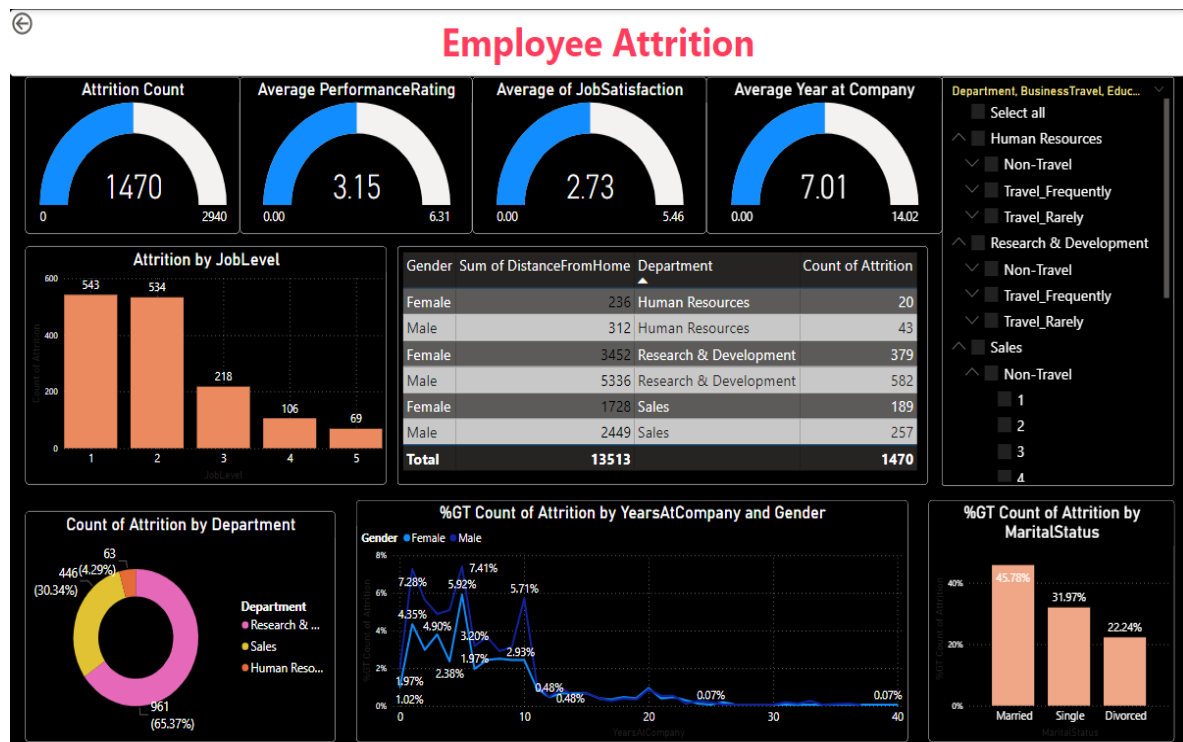
Utilized the data import functionality to connect to our data source and load the relevant datasets. Imported data from a CSV file into Power BI and loaded it into Power BI Desktop.

- **Visualization Design:**

Selected appropriate visualizations such as KPI's, bar charts, line charts, tables, etc.

Customized visualizations with titles, axis labels, and formatting options.

Created interactive elements- slicer.



1. KPI's:

KPI's are important to track long term performance.

- 1.1. Attrition Count: Which represents the number of employees who have left the company. The total attrition count within the specified period is 1470 which represents the total number of employees who have left the company during the specified timeframe
- 1.2. The average performance rating: Which represents the mean performance scores assigned to employees based on their evaluations and it is 3.15 for total.
- 1.3. The average job satisfaction score: It represents the collective level of satisfaction among employees regarding their work environment, role, and organizational culture. Average satisfaction score is 2.73
- 1.4. The average years at the company: It represent the mean tenure of employees within the organization.

2. Slicer:

3. Department, Business Travel, and Education Level Slicer: This slicer allows users to filter data based on three key criteria: department, business travel frequency, and education level. Users can select from various options within each category to dynamically refine their analysis.
4. For departments, users can choose from options such as HR, Sales, R& D, etc.
5. Business travel frequency options include "Frequently," "Rarely," and "Non-Travel."
6. Education level options may include "1: 'Below College'," "2: 'College'," "3: 'Bachelor'," "4: 'Master'," "5: 'Doctor'" By consolidating these categories into one slicer, users can quickly and intuitively filter data

3. Bar Chart: Count of Attrition by Job Level

The bar chart illustrates the count of attrition cases categorized by job level within the organization

Level 1: 543 attrition cases.

Level 2: 534 attrition cases.

Level 3: 218 attrition cases.

Level 4: 106 attrition cases.



Level 5: 69 attrition cases.

The bar chart shows a visual representation of attrition distribution by job level, where attrition cases are high in lower level jobs whereas it is less in higher job levels.

#### 4. Table: Gender, Sum of Distance from Home, Department, and Count of Attrition

The table provides a comprehensive analysis of attrition trends based on gender, department, and distance from home among employees within the organization.

Gender: Attrition is higher among male employees compared to female employees.

Department:

R and D department: Highest attrition rate observed for both genders.

HR department: Lowest attrition rate observed for both genders.

Sales department: Attrition rate falls between R and D and HR departments.

Distance from Home:

Male employees in R and D department have higher average distance from home compared to other departments.

Female employees in HR department have lower average distance from home compared to other departments.

#### 5. Donut Chart: Attrition Distribution by Department

R and D Department: Accounts for the majority of attrition cases, comprising 65.37% of total attrition.

Sales Department: Represents 30.34% of attrition cases.

HR Department: Has the lowest attrition rate, accounting for only 4.29% of total attrition

#### 6. Percentage Count by Years at Company and Gender:

This analysis presents the percentage distribution of employees by years at the company, categorized by gender.

Male employees has higher percentage compared to female employees across all years at the company.

The line graph shows that the percentage peaks at 5 years and 1 year, gradually decreasing after 5 years for both genders.

#### 7. Percentage Count of Attrition by Marital Status:

This analysis presents the percentage distribution of attrition cases categorized by marital status among employees within the organization.

Attrition is highest among married employees, accounting for 45.78% of total attrition cases.

Single employees represent 31.97% of attrition cases.

Divorced employees have the lowest attrition rate, comprising 22.24% of total attrition cases.

- **Dashboard Creation:**

Once the visualizations were designed, assembled them into interactive dashboards within Power BI.

## **Conclusion**

In conclusion, observed variations in attrition rates based on demographic factors such as gender, marital status, and education level. Male employees and married individuals showed higher attrition rates compared to their counterparts.

Attrition rates varied significantly across different departments, with the R and D department experiencing the highest turnover, followed by the Sales department, while the HR department demonstrated the lowest attrition rate.

Tenure Analysis: Employees' tenure at the company emerged as a crucial factor influencing attrition, with attrition rates peaking at specific tenure milestones, particularly at 5 years and 1 year, and gradually decreasing thereafter.

Distance from Home Analysis: There was a correlation between distance from home and attrition rates, with employees in departments requiring frequent travel, such as R and D, exhibiting higher turnover compared to those with less travel requirements, such as HR.

Marital Status Analysis: Marital status also played a significant role in attrition rates, with married employees demonstrating the highest turnover, followed by single individuals, while divorced employees exhibited the lowest attrition rate.

## **Future scope**

**Employee Experience Enhancement:**

Focusing on enhancing the overall employee experience through initiatives such as employee engagement programs, career development opportunities, and work-life balance initiatives can contribute to improved retention rates and organizational performance.

**Continuous Feedback Mechanisms:**

Establishing robust feedback mechanisms, including regular employee surveys, exit interviews, and performance evaluations, facilitates ongoing dialogue between employees and management.