

Employee Attrition Analysis and Prediction

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.

Data Preprocessing and Cleaning:

For data cleaning I used python pandas library. With the help of pandas I have first removed the unwanted or irrelevant columns(Employee Number, Standard Hours, Over18) for the analysis. Then I Checked for any for missing values and removed the rows that may contain any missing values. And dropped any duplicate rows .

Dashboard Building and Reporting:

I used power BI to build the dashboard these are the various steps that I have followed to create dashboard with data visualization .I have installed powerBI and loaded the cleaned data which was cleaned by using python. With the help of power query I have transformed data of two columns: Attrition and Education into Attrition count and Education Level where "Yes" is represented with 1 and "No" is represented with 0 and for Education field represented as 1: 'Below College'," "2: 'College'," "3: 'Bachelor'," "4: 'Master'," "5: 'Doctor'. After

transforming the data with the help of PowerQuery I have built my dashboard with data visualizations to know the factors influencing Attrition.

PowerBI Key Performance Indicator(KPIs):-

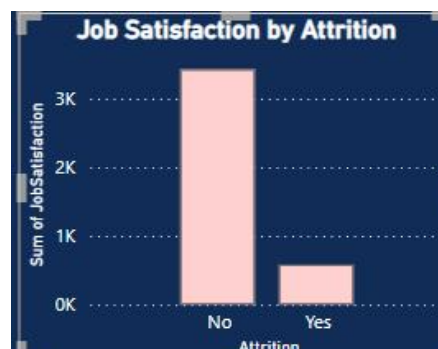
- **Total Employees-** This KPI indicates the total number of employees currently employed by the organization with the help of count of Employee Count.
- **Attrition-** Attrition refers to the number of employees who left the organization. We have found this Indicator with the help of count of newly created column Attrition Count with already existing column named Attrition having “Yes” and “No” values.
- **Attrition Rate-** The attrition rate is a percentage that represents the proportion of employees who leave the organization compared to the total number of employees. This KPI helps in understanding the rate at which employees are leaving the organization.

It is calculated as: $\text{Attrition Rate} = (\text{Number of Attritions} / \text{Total Employees}) * 100$.

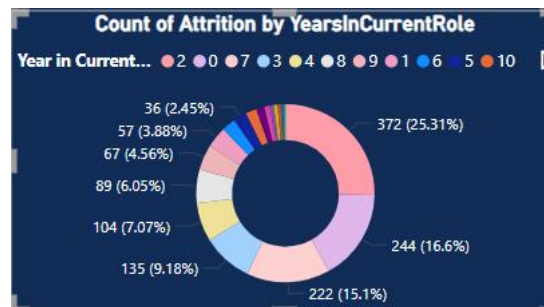
- **Active Employees-** The Active Employees is the number of employees present and working currently in the company.
It is calculated as: $\text{Active Employees} = \text{Total Employees} - \text{Attrition}$.

Data Visualization in PowerBI:

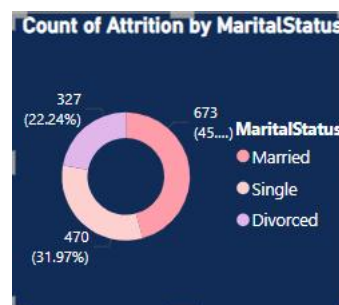
- Data Visualization used along with the above KPIs were:
 1. **Job Satisfaction by Attrition:**



2. Count of Attrition by Years In Current Role:



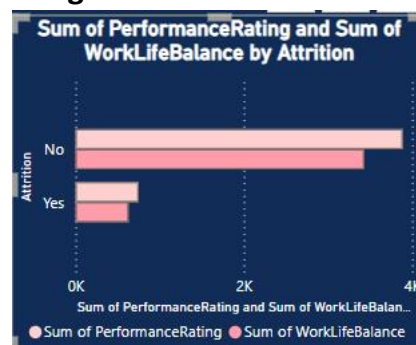
3. Count of Attrition by Marital Status:



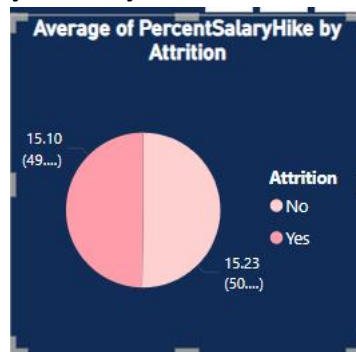
4. Count of Attrition Count by Business Travel Frequency:



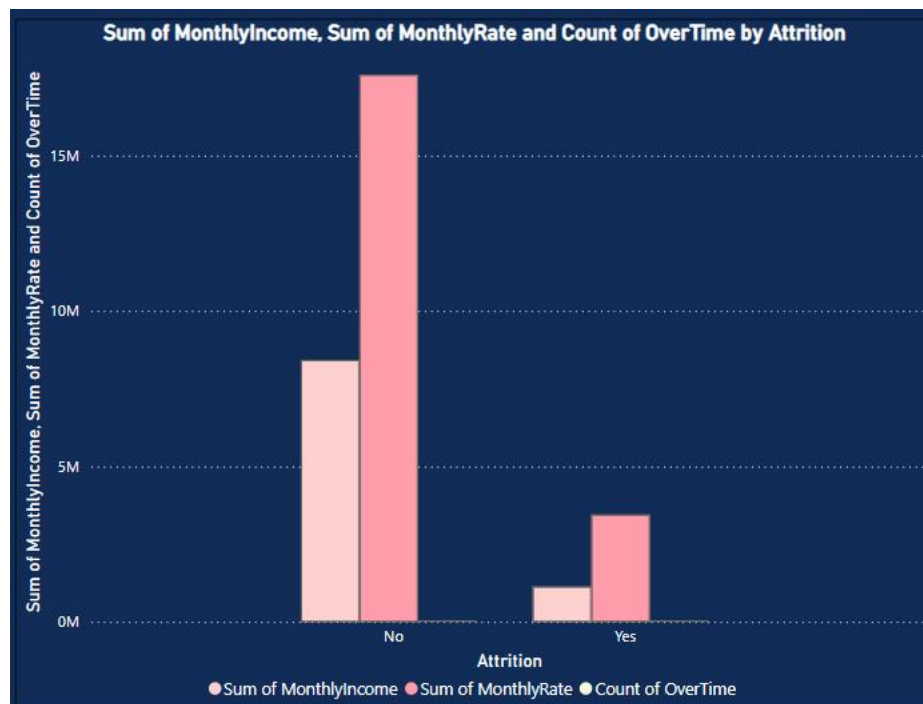
5. Sum of Performance Rating and Sum of Work Life Balance by Attrition:



6. Average of Percent Salary Hike by Attrition:



7. Sum of Monthly Income, Sum of Monthly Rate and Count of Over Time by Attrition:



- After adding the above visualization for better understanding the attrition when compared with other attributes/factors/columns.
- I have also added slicers for the users/customers for getting more customized outputs of KPIs and Visualization:
 - 1) Gender.
 - 2) Department.
 - 3) Distance from Home.
 - 4) Education Field.
 - 5) Years with Current manager.

→ The below are KPIs which were determined for the given company:

| Total Employees | Attrition Count | Attrition Rate | Active Employees |
|-----------------|-----------------|----------------|------------------|
| 1470 | 237 | 16.12% | 1233 |

- The above KPIs show that the Attrition Rate is 16.12% and that the attrition of the given company is not in worst condition. But have to improve in few areas to retain their employees.
- The areas to improve to retain the employees are determined with the help of visualization:
 - The Attrition is effected by the Years in a current role where if a employee is present in a same role for 2-7years are most likely to leave.
 - The Attrition is effected By the Marital Status of a employee where most likely marriage people are leaving the company.
 - The Attrition is effected By the Salary Hike Percentage where the percentage of the hike is less they are likely to leave the company.
 - The Attrition is effected By the Business Travel Frequency where rarely travelling employees are likely to leave.

Real-time Improvements for Acme Corporation:

- Although the Attrition Rate of the Acme Corporation is not very high and likely to be in risk in near future.
- They can take few steps for reducing the attrition and for the betterment of the Employees and as well as the company, such as :
 - Increasing the percent of Hikes,
 - Training the employees with current trending Technologies,
 - Continuous Feedback about being in the same role , Environmetal satisfaction and Employee Satisfaction
 - Promotions.
 - For having work life balance they can keep Refreshment Programs and interactive activates.
 - Encouraging the married women with work benefits.

Real-time Integration:

We can add Machine Learning Models for predicting precisely and also to analyse the data of any company visually which makes it easy to understand. So this can be used to do HR Analysis, Generating reports for a companies Audit etc.