TECHNOCOLABS SOFTWARES

2024 ATTRITION FORECAST ANALYSIS DASHBOARD BY TABLEAU

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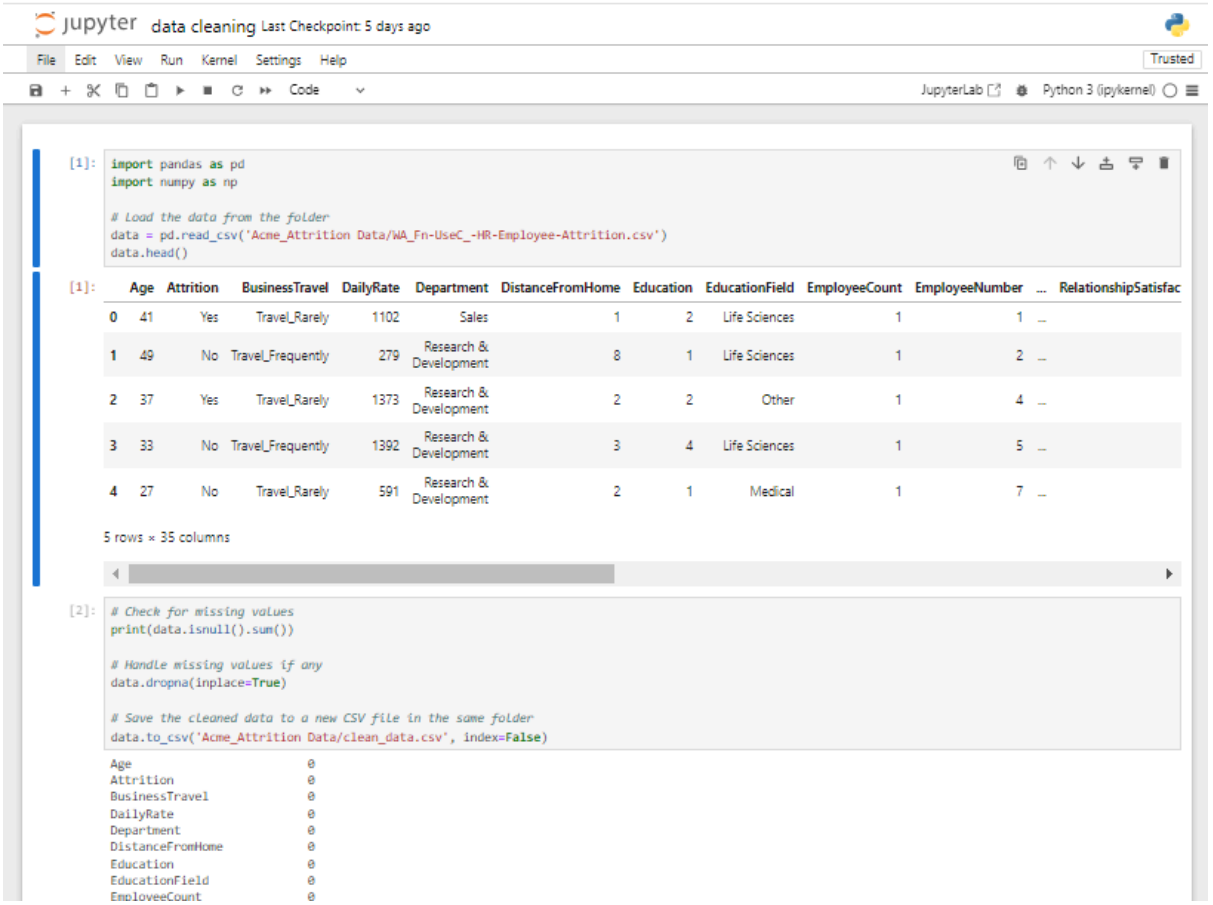
Introduction

Employee attrition, or the rate at which employees leave an organization, is a major concern for businesses across all industries. High attrition rates can lead to increased recruitment costs, disruption of operations, and loss of valuable talent, all of which can negatively impact a company's overall performance and competitiveness. Addressing this issue requires a deep understanding of the factors contributing to employee turnover, as well as the ability to foresee potential risks before they materialize.

In today's data-driven world, Business Intelligence (BI) has become an essential tool for organizations seeking to gain insights into their workforce dynamics. BI enables companies to collect, analyze, and visualize data in ways that uncover hidden patterns, trends, and correlations. By harnessing the power of BI, organizations can make informed decisions that enhance employee retention and reduce turnover.

This project, titled **"Acme Attrition Forecast: Analysis and Prediction,"** is centered on leveraging BI tools to analyze employee attrition at Acme Corporation. The goal is to provide actionable insights that help the organization understand the root causes of attrition and develop effective strategies to retain its workforce.

Data Cleaning Process



The data cleaning process involved several key steps to prepare the dataset for analysis. Here's a breakdown based on the screenshots provided:

1. Loading the Dataset:

- The dataset was loaded into a Pandas DataFrame using the `pd.read_csv()` function. This allowed for an initial inspection of the data to understand its structure and content.
- The dataset includes various columns such as `Age`, `Attrition`, `BusinessTravel`, `DailyRate`, `Department`, etc., representing different attributes of employees

2. Checking for Missing Values:

- The next step involved checking for any missing values in the dataset. This was done using the `data.isnull().sum()` function, which provides a summary of the missing values for each column.
- As shown in the screenshot, there were no missing values in the dataset (`0` for all columns), which means there was no need for imputation or further handling of missing data.

3. Handling Missing Values:

- Even though the dataset had no missing values, a command to drop any potential missing values was included using `data.dropna(inplace=True)`. This ensures that if any missing values existed, they would be removed from the dataset.

4. Saving the Cleaned Data:

- After cleaning the data, it was saved to a new CSV file named `clean_data.csv` in the `Acme_Attrition Data` folder. This step was accomplished using the `data.to_csv()` function, allowing the cleaned data to be stored for further analysis.

These steps ensured that the dataset was free from missing values and other inconsistencies, making it ready for the subsequent analysis and visualization processes. This clean dataset was crucial for generating accurate insights and building reliable predictive models later in the project.

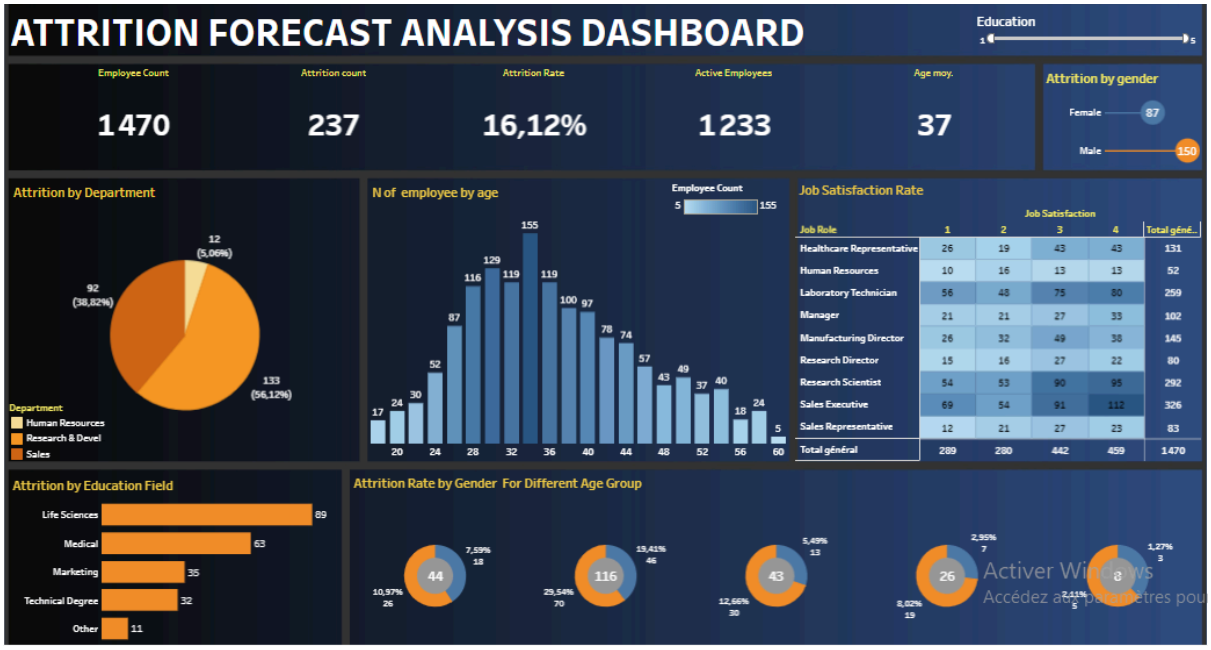
Data Exploration and Visualization

Using Tableau, we created interactive dashboards to visualize trends and patterns in employee turnover. Key visualizations include:

- **Department-wise Attrition:** Analyzes the percentage of employees leaving from different departments. Sales, Human Resources, and Research & Development show the highest attrition rates.
- **Field-wise Attrition:** Shows the attrition distribution across different educational backgrounds, highlighting which fields have higher turnover rates.
- **Employee Age Distribution:** A histogram depicting the distribution of employees by age, which helps in understanding attrition trends across different age groups.
- **Attrition by Gender and Age Group:** Pie charts showing how attrition varies by gender and across different age groups.

- **Job Satisfaction Rate:** A heatmap reflecting the job satisfaction levels across various job roles, indicating the correlation between satisfaction and attrition rates.

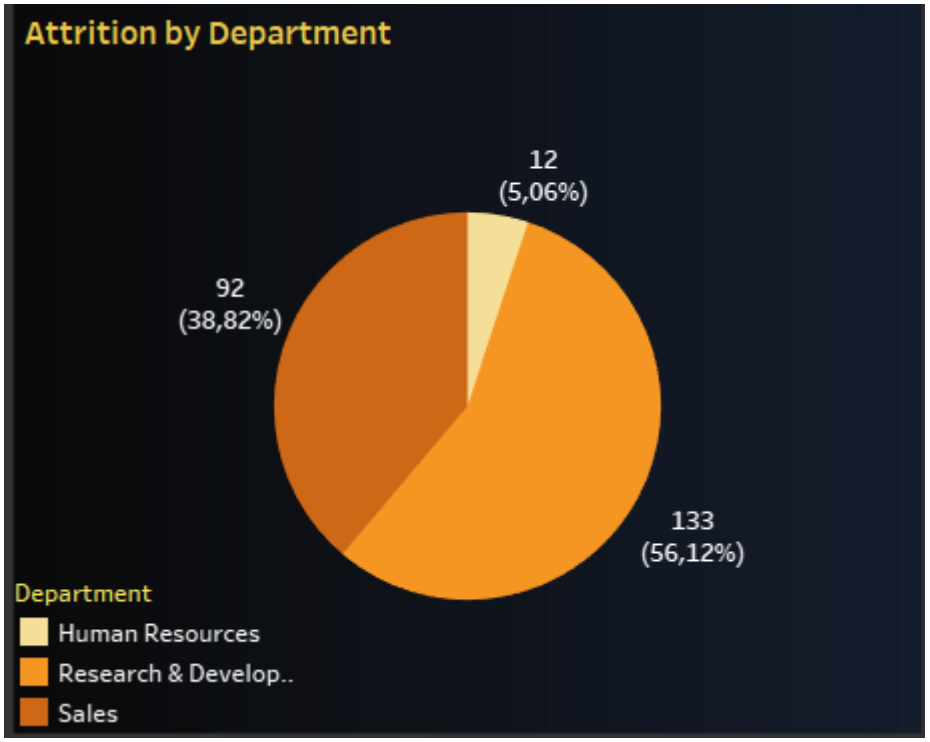
Dashboard Overview



1. **Top-Level Metrics:**
    - **Employee Count:** The total number of employees is 1,470.
    - **Attrition Count:** A total of 237 employees have left, resulting in an attrition rate of 16.12%.
    - **Active Employees:** Currently, there are 1,233 active employees.
    - **Average Age:** The average age of the employees is 37 years.

Detailed Analysis

Attrition by Department



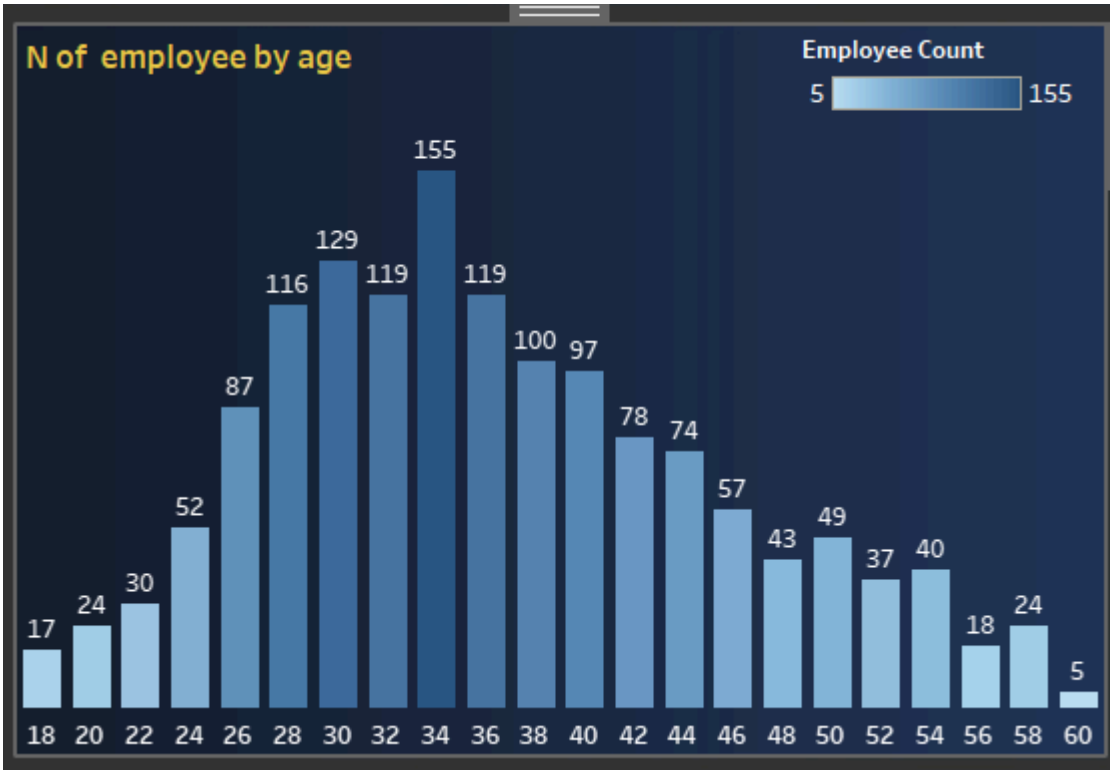
Piechart :Attrition by Department

Insights:

- The Sales department has the highest attrition rate at 56.12%, with 133 employees leaving.
- Research & Development follows with an attrition rate of 38.82%, representing 92 employees.
- Human Resources has the lowest attrition rate at 5.06%, with only 12 employees leaving.

Conclusion: The high turnover in Sales may indicate issues related to job satisfaction, workload, or compensation, which should be addressed to reduce attrition in this department.

Number of Employees by Age



Bar Chart: Number of Employees by Age

Insights:

- The majority of employees fall within the age group of 28-32, with 155 employees.
- There is a significant drop in the number of employees as age increases, particularly after the age of 40.

Conclusion: The age group of 28-32 is crucial for retention strategies. Special attention should be given to employees in this age bracket, as they represent a significant portion of the workforce.

Job Satisfaction Rate

Job Role	Job Satisfaction 1	2	3	4	Total géné..
Healthcare Representative	26	19	43	43	131
Human Resources	10	16	13	13	52
Laboratory Technician	56	48	75	80	259
Manager	21	21	27	33	102
Manufacturing Director	26	32	49	38	145
Research Director	15	16	27	22	80
Research Scientist	54	53	90	95	292
Sales Executive	69	54	91	112	326
Sales Representative	12	21	27	23	83
Total général	289	280	442	459	1 470

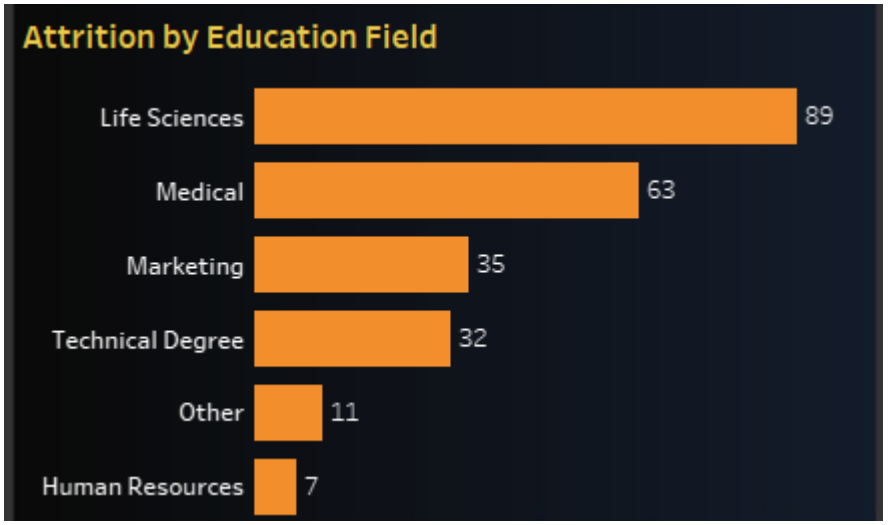
Heatmap: Job Satisfaction Rate

Insights:

- Job roles such as Research Scientist and Sales Executive have a notable number of employees with low job satisfaction (ratings of 1 and 2).
- Conversely, roles like Manager and Research Director have higher job satisfaction ratings, with more employees rating their satisfaction as 4 or 5.

Conclusion: Low job satisfaction in critical roles like Sales Executive is a red flag. This could be a significant factor contributing to high attrition rates and should be addressed promptly.

Attrition by Education Field:



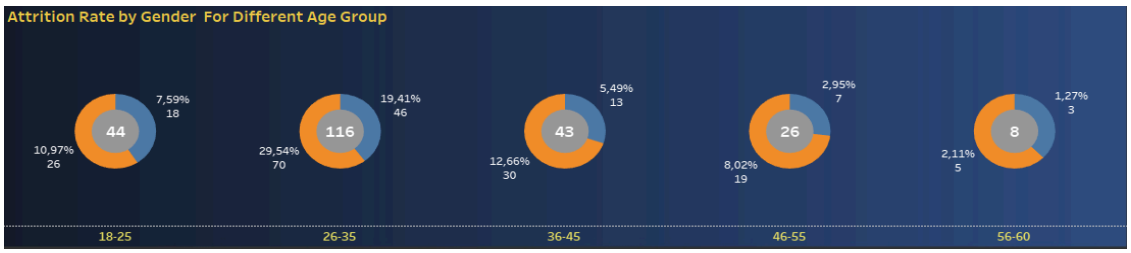
Bar Chart: Attrition by Education Field

Insights:

- Employees with a background in Life Sciences (89) and Medical (63) fields show the highest attrition.
- Marketing and Technical Degree holders have lower attrition rates, with 35 and 32 employees leaving, respectively.

Conclusion: There is a need to explore why employees from Life Sciences and Medical backgrounds are leaving at a higher rate, possibly due to mismatches between job roles and qualifications.

Attrition Rate by Gender for Different Age Groups



Donut Charts: Attrition Rate by Gender for Different Age Groups

Insights:

- Males (150) have a higher attrition rate compared to females (87).
- The age group 28-32 has the highest attrition rate across both genders, with 116 employees leaving.

Conclusion: Gender-specific retention strategies might be necessary, especially for males in the 28-32 age group.

Conclusion

The analysis of employee attrition at Acme Corporation has shed light on key areas that require attention to improve employee retention. By examining factors such as department, age, job satisfaction, and education field, we have identified specific trends and patterns that can inform strategic decisions.

1. Departmental Attrition:The analysis shows that Research & Development and Sales departments experience higher turnover rates. These departments may benefit from focused retention strategies, including better support systems and career development opportunities.

2. Age and Attrition: The data reveals that younger employees, particularly those aged 26-36, are more likely to leave the organization. This indicates a need for targeted engagement initiatives to address the concerns of this age group, such as providing clear career progression paths and enhancing job satisfaction.

3. Job Satisfaction:The varying levels of job satisfaction across different roles suggest that a customized approach is needed to improve employee morale. Specific roles, like Research Scientists and Sales Representatives, require tailored interventions to boost satisfaction and reduce turnover.

4. Educational Background: Employees with degrees in Life Sciences and Medical fields have higher attrition rates. Understanding their unique challenges and providing additional support or opportunities may help in retaining these employees.

5. Gender Dynamics: The analysis of attrition by gender and age groups highlights that male employees in their 30s are more likely to leave. Addressing the specific needs of this demographic could be key to reducing attrition rates.

In summary, this analysis provides actionable insights that Acme Corporation can use to refine its HR strategies. By focusing on the specific factors that drive attrition, the organization can implement more effective retention programs, ultimately leading to a more stable and satisfied workforce.