Employee Attrition Analysis and Prediction Report

Data Preprocessing

1. Data Exploration:

I began by exploring the provided dataset from Acme Corporation, focusing on employee demographics, job satisfaction metrics, work environment indicators, and turnover status. This step involved understanding the dataset's structure, examining feature distributions, detecting missing values, and identifying potential outliers.

2. Data Cleaning:

Next, I performed data cleaning to ensure data integrity and reliability. This involved handling missing values by imputation or removal, addressing outliers if present, and standardizing data formats across variables. Data cleaning aimed to prepare a clean and consistent dataset for further analysis.

3. Data Encoding:

To prepare categorical variables for analysis, I employed data encoding techniques such as one-hot encoding or label encoding. This step converted categorical variables into numerical format, making them suitable for machine learning algorithms and statistical analysis.

4. Data Labeling:

In certain cases, I applied data labeling to create meaningful categories or bins for continuous variables. For example, I categorized age groups, education levels, and years of service into labeled intervals to facilitate analysis and interpretation.

Key Learnings:

Through the data preprocessing and cleaning process, I gained valuable insights and skills:

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- Understanding data distributions and patterns.

- Handling missing data and outliers effectively.

- Converting categorical variables into numerical format.

- Creating labeled categories for continuous variables.

- Ensuring data consistency and preparing a reliable dataset for analysis.

Conclusion:

Data preprocessing and cleaning are foundational steps in any data analysis or machine learning project. By carefully exploring, cleaning, encoding, and labeling the dataset, I laid the groundwork for meaningful analysis and predictive modeling to address Acme Corporation's employee attrition challenge.

Tableau Dashboard Development

1. Data Connection:

I connected Tableau to the provided dataset from Acme Corporation, establishing a live data connection to ensure real-time updates and accurate analysis.

2. Data Exploration and Cleaning:

Utilizing Tableau's drag-and-drop interface, I explored the dataset visually, identifying data quality issues such as missing values or outliers. I also cleaned the data within Tableau by applying filters, data transformations, and calculations to ensure data integrity.

3. Key Metrics Calculation:

I created calculated fields in Tableau to derive key metrics crucial for analysis, including turnover rate, average job satisfaction, and performance ratings. These calculated fields provided actionable

insights into employee attrition factors.

4. Descriptive Analytics:

Using Tableau's visualization capabilities, I generated detailed reports showcasing the reasons for attrition based on job satisfaction, work-life balance, and relationship satisfaction. I utilized treemaps, heatmaps, and packed bubbles to visualize turnover patterns across different dimensions, providing stakeholders with clear and intuitive insights.

5. Predictive Analytics Integration:

I integrated the results from predictive models into Tableau for dynamic visualization, enabling stakeholders to visualize predicted turnover trends over time. Trend lines and forecast models were utilized to present future attrition trends effectively.

6. Dashboard Layout and Design:

I designed the Tableau dashboard with a user-centric approach, focusing on intuitive layout and user experience. Utilizing Tableau's layout containers and floating objects, I organized visualizations logically, creating a seamless navigation experience for stakeholders.

Conclusion and Outcomes:

Through Tableau dashboard development, I provided Acme Corporation with a powerful tool for analyzing employee attrition factors, predicting turnover trends, and gaining actionable insights. The dashboard's interactive features, clear visualizations, and real-time data integration empowered stakeholders to make informed decisions and implement targeted retention strategies. Overall, the Tableau dashboard significantly contributed to addressing Acme Corporation's employee turnover challenges and improving workforce management practices.

Descriptive Analytics Report

1. Employee Demographics:

The dataset included a wide range of demographic information such as age, gender, marital status, and education level. Key findings included:

- A significant portion of the workforce was in the age group of 30-40 years.

- The gender distribution was relatively balanced.

- Employees with a Bachelor's degree constituted the largest education group.

- The majority of employees were married.

2. Reasons for Attrition:

The analysis of attrition reasons revealed several key insights:

- Job Satisfaction: Employees with lower job satisfaction scores were more likely to leave the company.

- Work-Life Balance: Poor work-life balance was a significant factor contributing to attrition.

- Relationship Satisfaction: Employees dissatisfied with their relationships at work, especially with their supervisors, showed higher attrition rates.

- Monthly Income: Lower monthly income levels were correlated with higher attrition.

Visualizations:

To illustrate these findings, I created the following visualizations in Tableau:

- Treemaps showing the distribution of employees across different departments and job roles, highlighting areas with higher attrition.

- Heatmaps to visualize job satisfaction, work-life balance, and relationship satisfaction scores across different employee segments.

- Packed Bubbles to represent the distribution of attrition reasons and their relative impact on

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employee turnover.