HR CASE STUDY

SUBMISSION

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Introduction

To conduct a study to assess the reasons for high attrition rate in XYZ as per the request of the management.

XYZ employs around 4000 employees at any point of time. The average annual attrition rate is around 15% for the company. This is highly detrimental to the interest of the company. Hence, a study was commissioned by the top management to study the reasons for the high attrition rate in the company.

Data on 4410 employees of the firm for a period of 1st January 2015 to 31st December 2015 was collated and analysis was done using Logistic Regression.

Overview: Data Set

The files containing data on 4410 employees of the firm for a period of 1st January 2015 to 31st December 2015 was shared by the XYZ. The various datafiles are:

1.) General Data File: Contains all the general information on the employee including demographics, and professional history.

2.) Employee Survey Data: Contains survey results conducted for the employees to measure the job satisfaction, environment satisfaction and work life balance.

3.) Manager Survey Data: Contains survey results for each employee by their managers regarding their job involvement and performance.

4.) In Time Data: Contains information on the time at which the employee arrived on each day during the period.

5.) Out Time Data: Contains information on the time at which the employee left the office on each day during the period.

Methodology

Logistic regression modelling was used to build the model. The steps at a high level carried out were as below :

1. Exploratory Data Analysis :
    a) Converting the data of in_time and out_time into Long format.
    b) Separated the date and time for each record.
    c) Merging both the files to derive the actual working hours of each employee.
    d) The data was aggregated at EmployeeID level to find the actual working hours of each employee.
    e) This dataframe was then merged with general_data along with employee survey and manager survey to get one master data frame having all information w.r.t an employee.

2. Model building
    a) Categorical variables with two distinct values were converted to levels.
    b) Categorical variables having more than two variables were split to create dummy variables and appended to the master data frame.
    c) Backward selection of variables for model building was used to find the optimal model.

3. Model Evaluation.
    a) The model thus built was tested in test data to check for its accuracy in the test data.
    b) Also , mathematical metrics like Accuracy , sensitivity , KS stats , Gain and lift for calculated for the model.

Assumptions

The following assumptions were made during the exploratory and data analysis stage:

- For datafiles containing the In and Out timings of the employees, wherever NA value was encountered, the date was ignored assuming that the employee was on leave on the said date.

- For missing values in the survey files (employee and manager) , median was replaced for NAs.

- In the general data , NAs were found in the below listed columns:
  - TotalWorkingYears : If the Number of companies worked is 0 , then total years of experience will be the number of years spent in the current organization.
  - TotalWorkingYears : If the Number of companies worked <> 0 , assuming the employee spends 1 year in each company , then the total number of years will be addition of years in current organization with Number of companies worked.
  - Numcompaniesworked : Keeping the same logic of employee spending atleast 1 year in the previous organizations , we can derive the number of companies worked by subtracting it with Total experience – number of years in the current organization.

Analysis

During the FY 2015, there was an attrition of 16.12% from XYZ. A total of 711 employees left the organisation during the period
The following parameters were found to affect the attrition rate the most:

- Age
- No of Companies in which the employee has worked in
- Total Work Experience
- Years since last promotion.
- The years under the current manager
- Marital Status
- Average Number of hours worked (Standard i.e. 8 hrs , less than 8 hrs and over 8 hrs)
- Department of the Employee
- Job Satisfaction Level
- Work Life Balance Level
- Environment Satisfaction
- Amount of Travel for Work involved

Each of the above contributing factor and its effect is explained further in the presentation.

Analysis Contd..

Effect of Age on Attrition

The graph shows that as the age increases, the attrition rate in general decreases.

The maximum attrition occurs among employees between the age of 18 -33 years.

Age vs Attrition
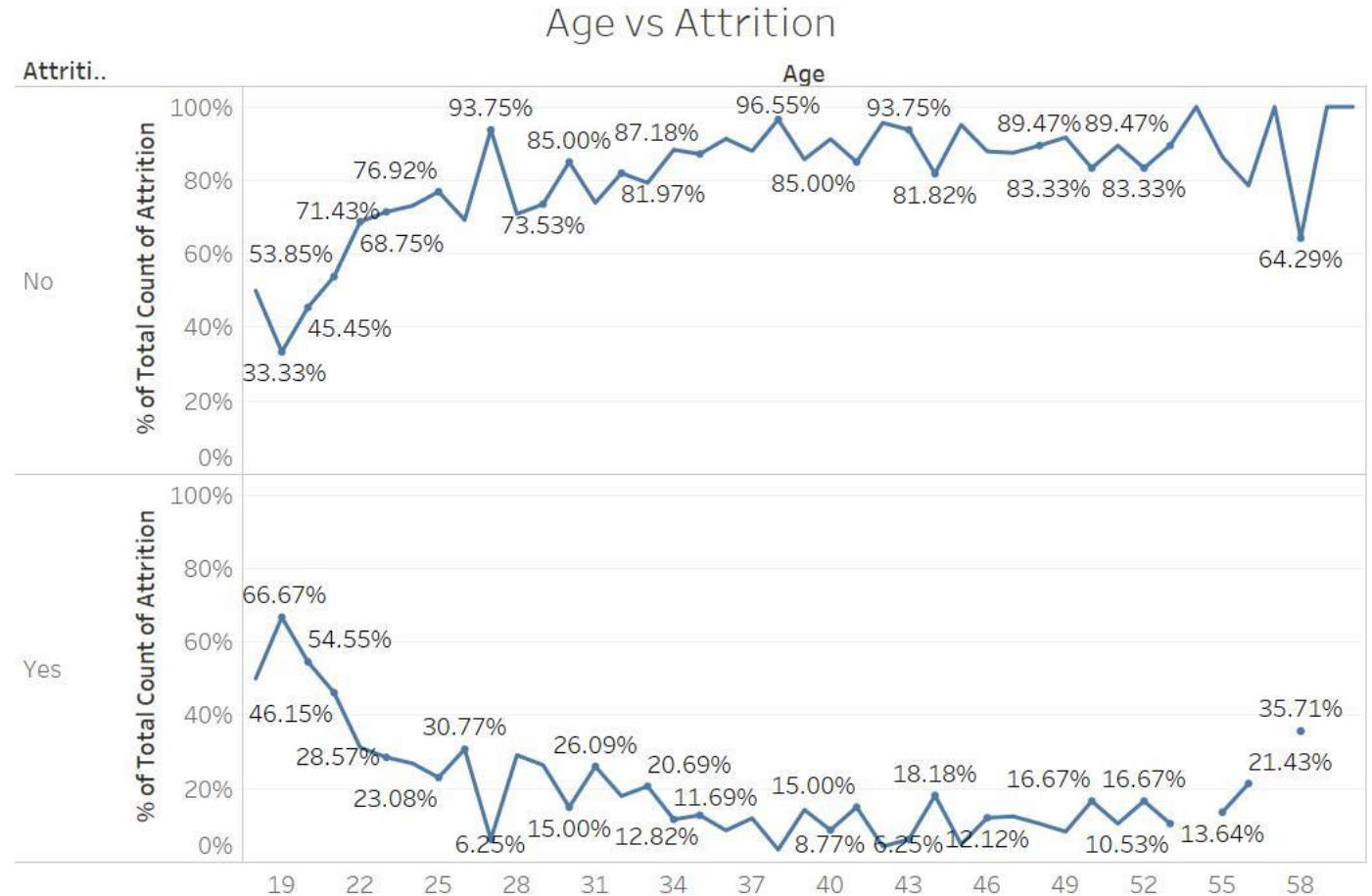
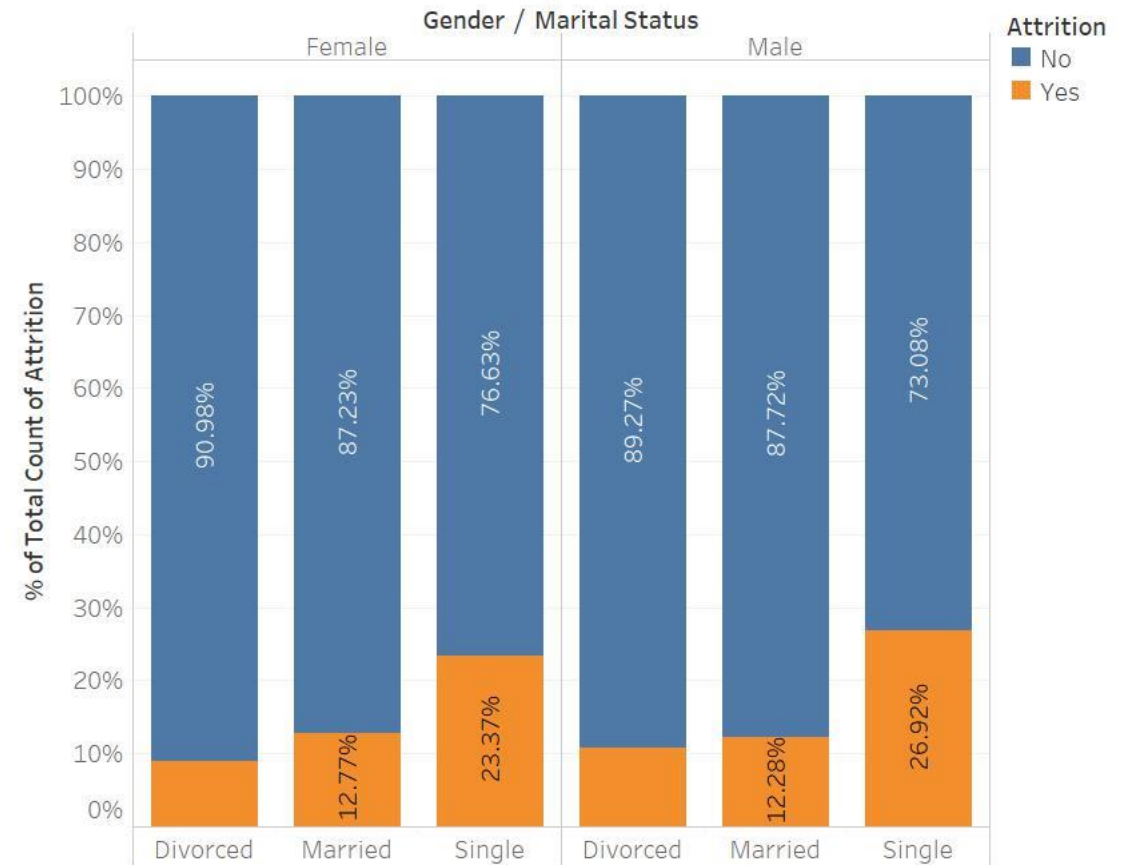The trend of % of Total Count of Attrition for Age broken down by Attrition.

Analysis Contd..

Effect of Marital Status on Attrition

As evident from the graph, Single employees have a higher chance of leaving the company, both among Male and Female employees, with more than 25% of Single Employees leaving the company during the period.

Divorced Employees have a much higher stickiness with the company with only 10% among the Divorced employees leaving the company during the period.

Relation of Gender and Marital Status on Attrition

% of Total Count of Attrition for each Marital Status broken down by Gender. Color shows details about Attrition. The view is filtered on Attrition, which keeps No and Yes.

Analysis Contd..

Effect of Total Work Experience on Attrition

The graph clearly shows that the employees with experience between 0-12 years leave the company much more.

In fact, employees in this bracket account for almost 80% of all employees leaving XYZ.

As the total work experience increases, the attrition rate decreases exponentially.

Total Experience vs Attrition

Total Working Years (bin)
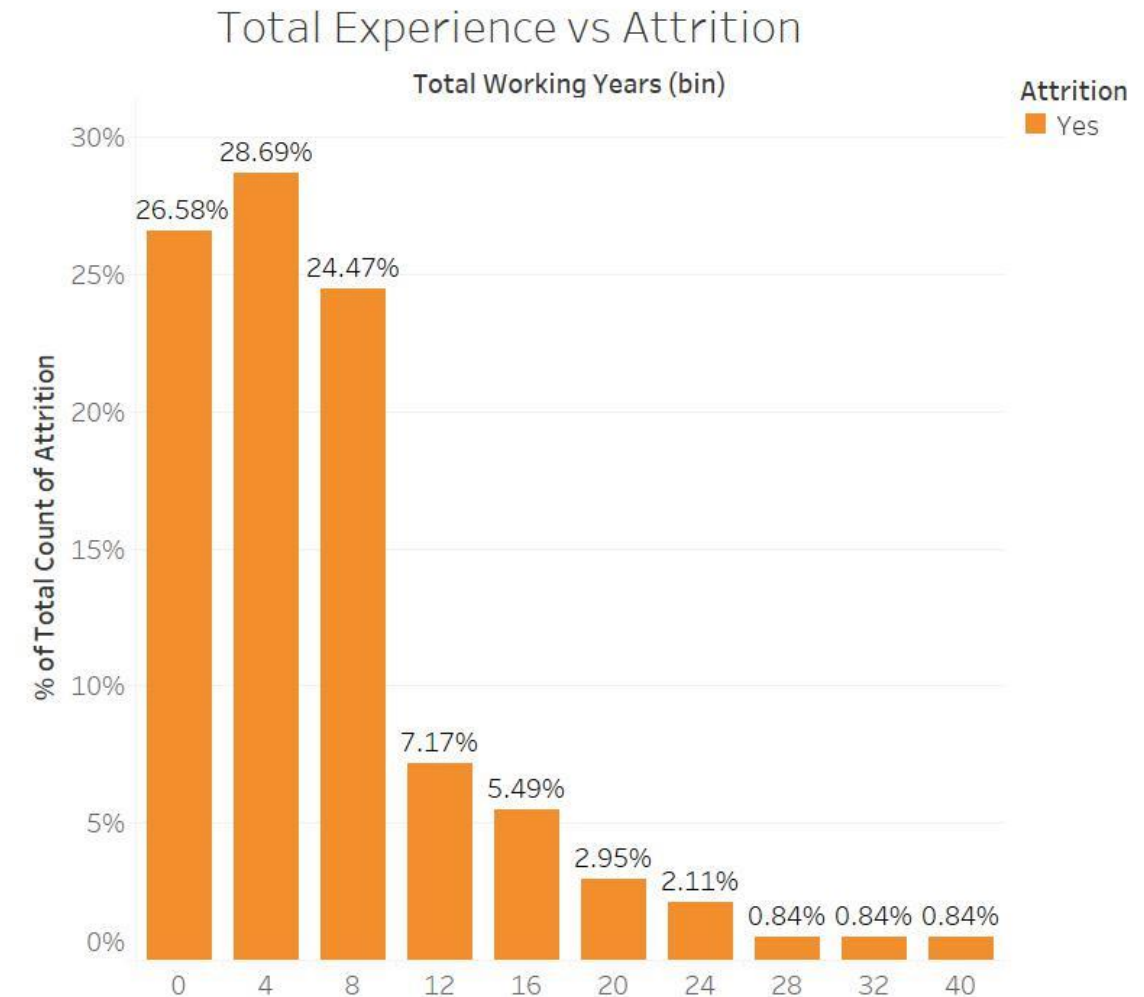
Attrition
■ Yes

% of Total Count of Attrition for each Total Working Years (bin). Color shows details about Attrition. The view is filtered on Attrition and % of Total Count of Attrition. The Attrition filter keeps Yes. The % of Total Count of Attrition filter keeps non-Null values only.

Analysis Contd..

Effect of Total Work Experience on Attrition

Interestingly, XYZ employs maximum people with work experience between 4-11 years and accounts for 54% of the total work force.

Total Working Years vs Attrition
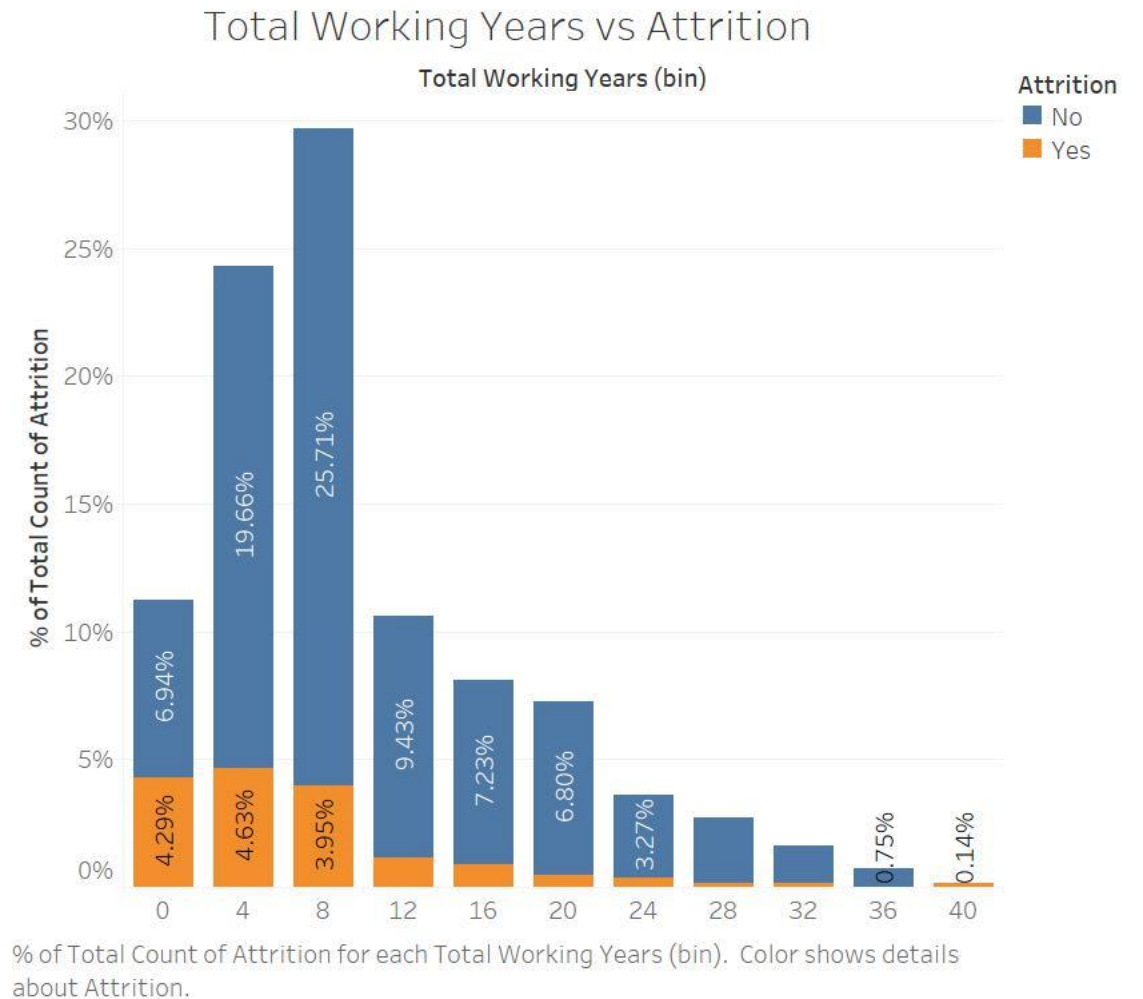
Analysis Contd..

Effect of No of Companies on Attrition

Employees who have worked in 5 or more companies have a very high attrition rate compared to employees outside this range.
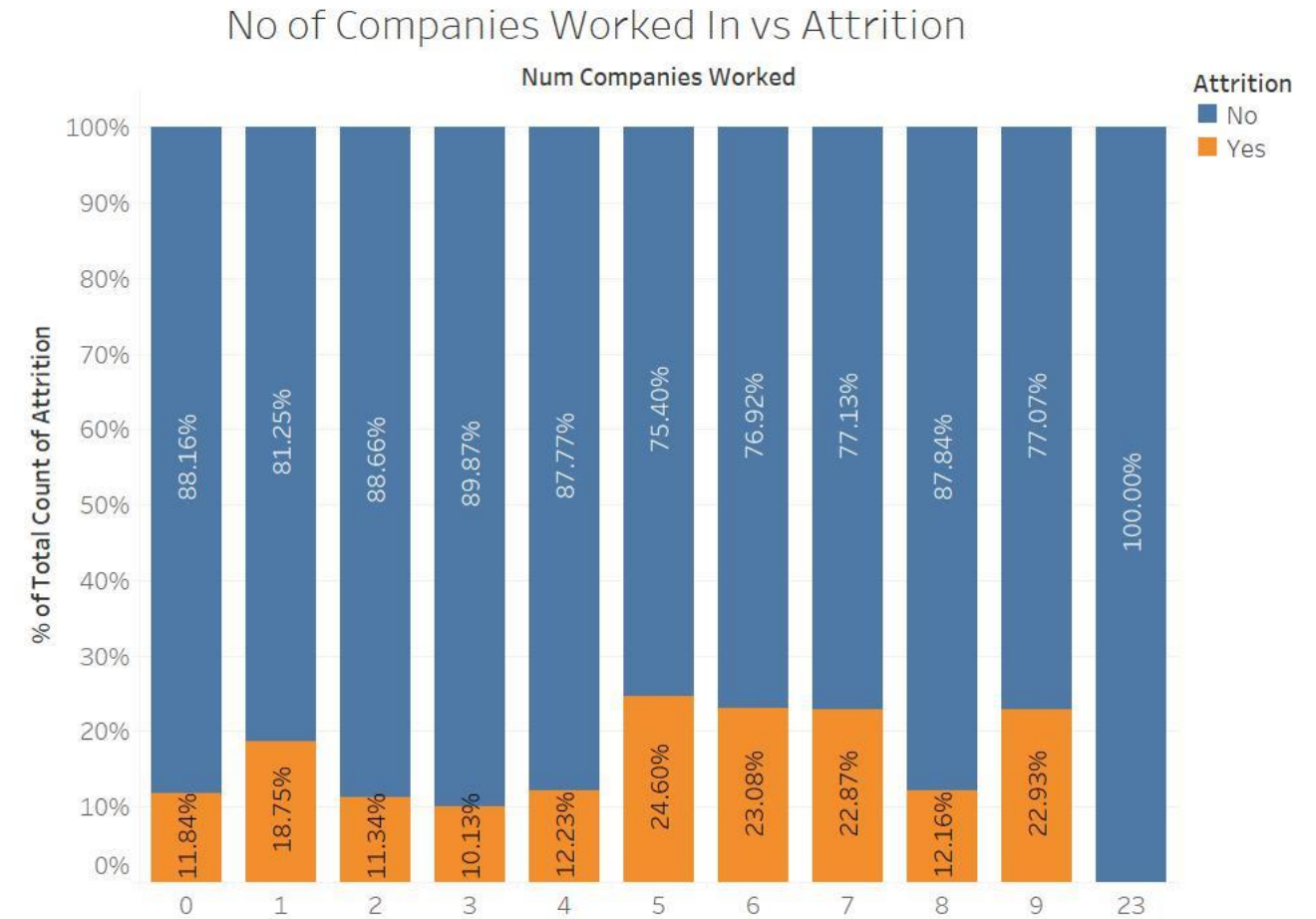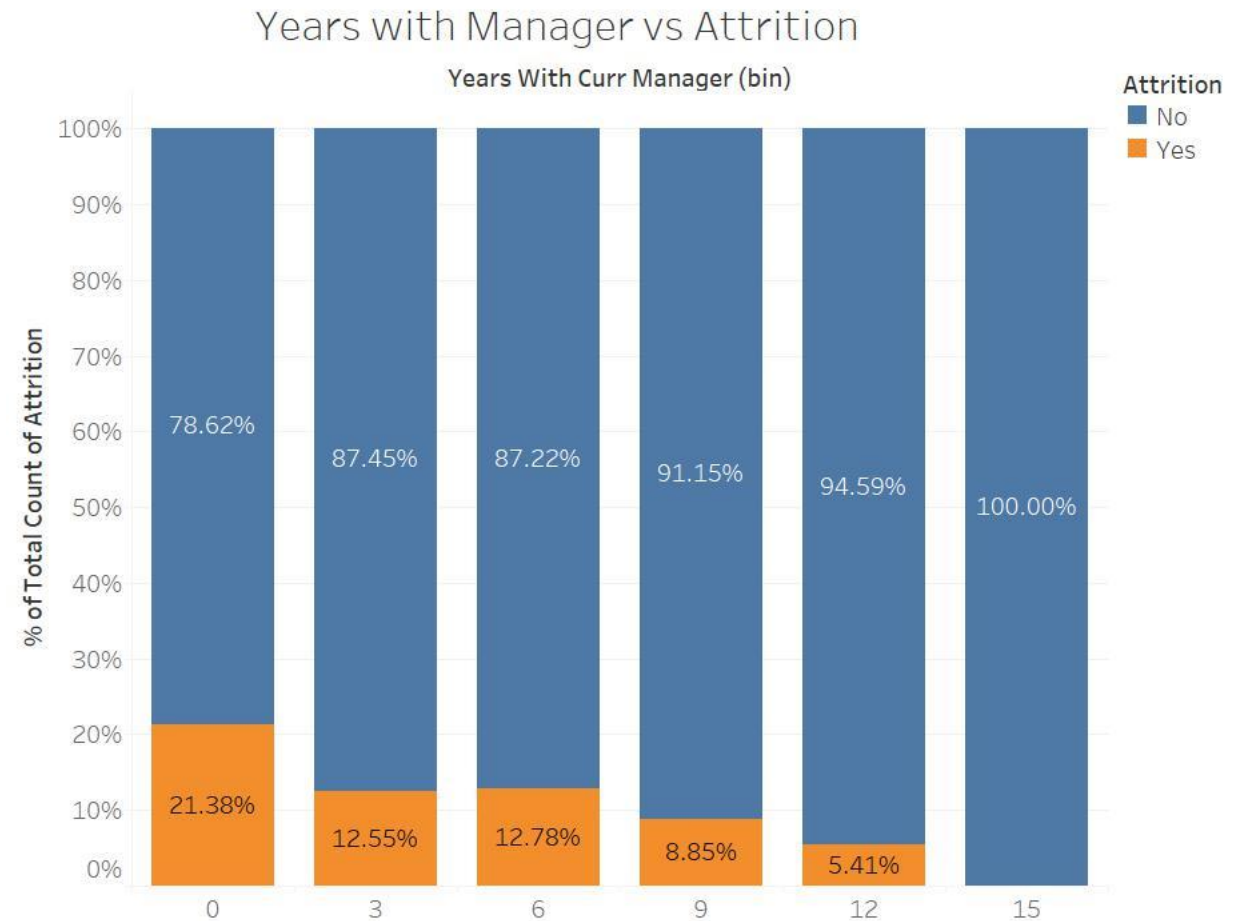
Analysis Contd..

Effect of Years with Manager on Attrition

The total number of years an employee has spent with the current manager has an inversely proportional relationship with the attrition rate.
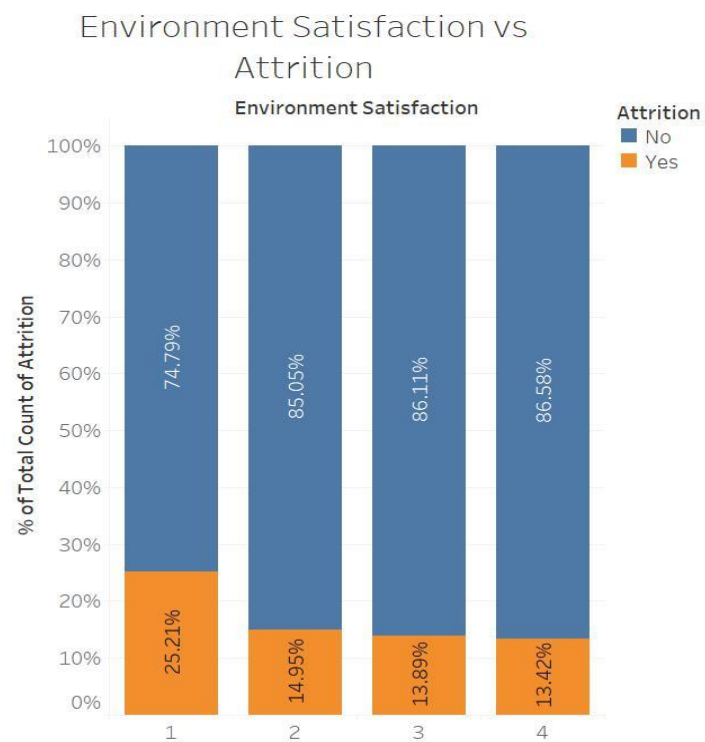

Years with Manager vs Attrition

Years With Curr Manager (bin)

Attrition
- No
- Yes

% of Total Count of Attrition for each Years With Curr Manager (bin). Color shows details about Attrition. The data is filtered on % of Total Count of Attrition, which keeps non-Null values only. The view is filtered on Attrition, which keeps No and Yes.
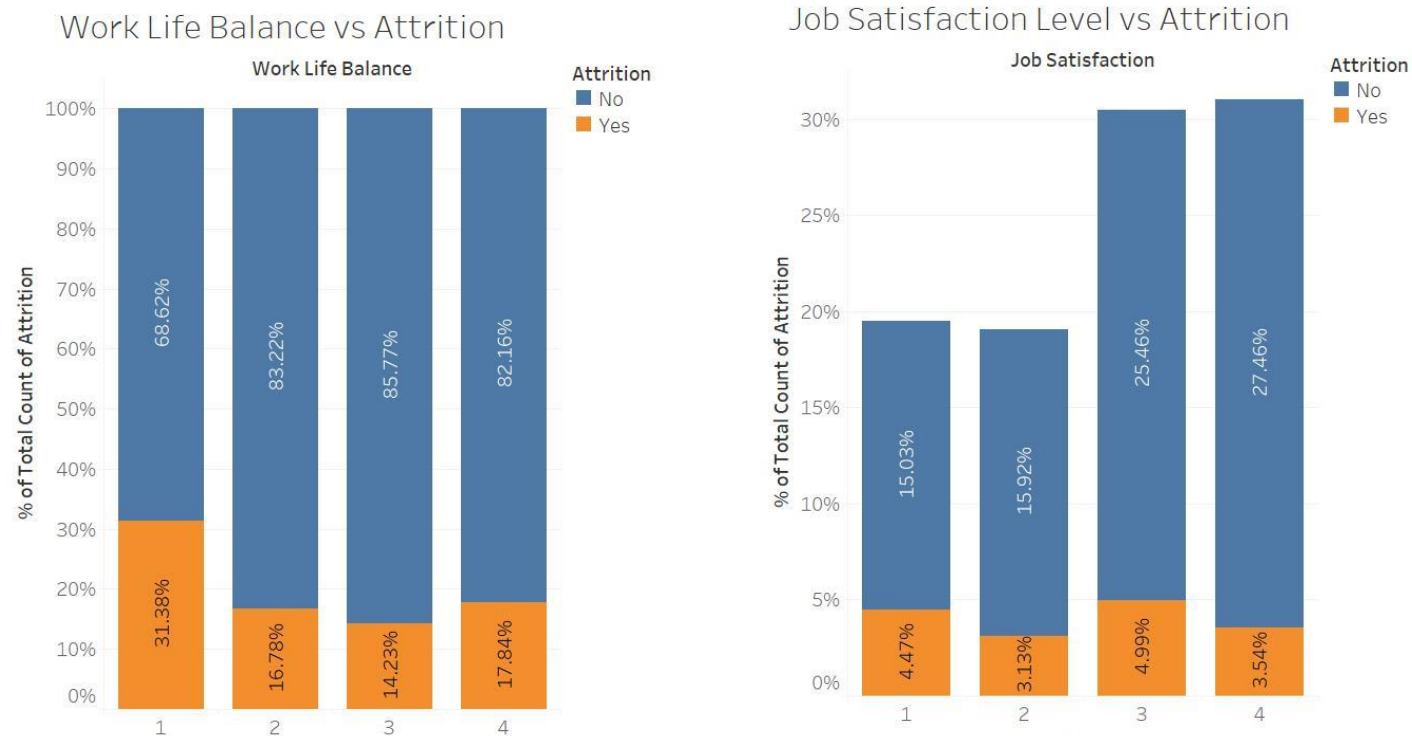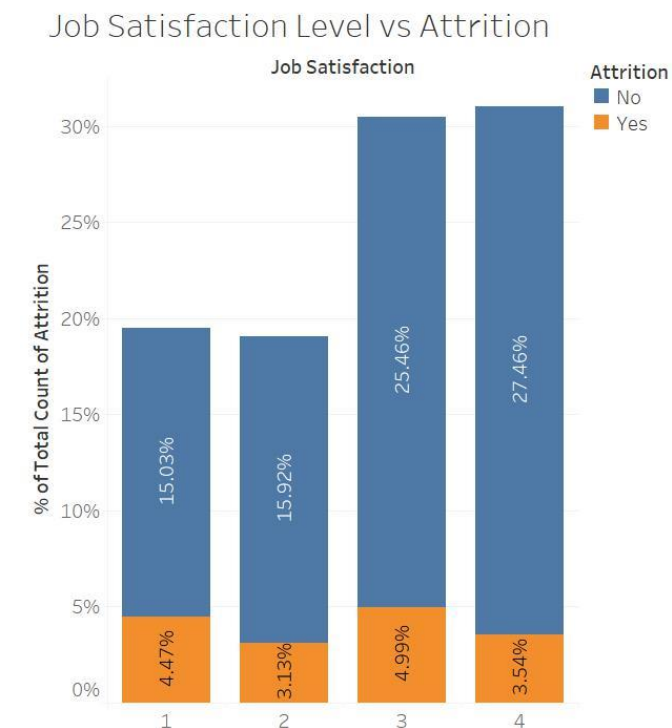
Analysis Contd..

As we see people with no travel are contributing to 92% of attrition. Travel can be offered to employee , esp the ones with no promotions.

Business Travel vs Attrition
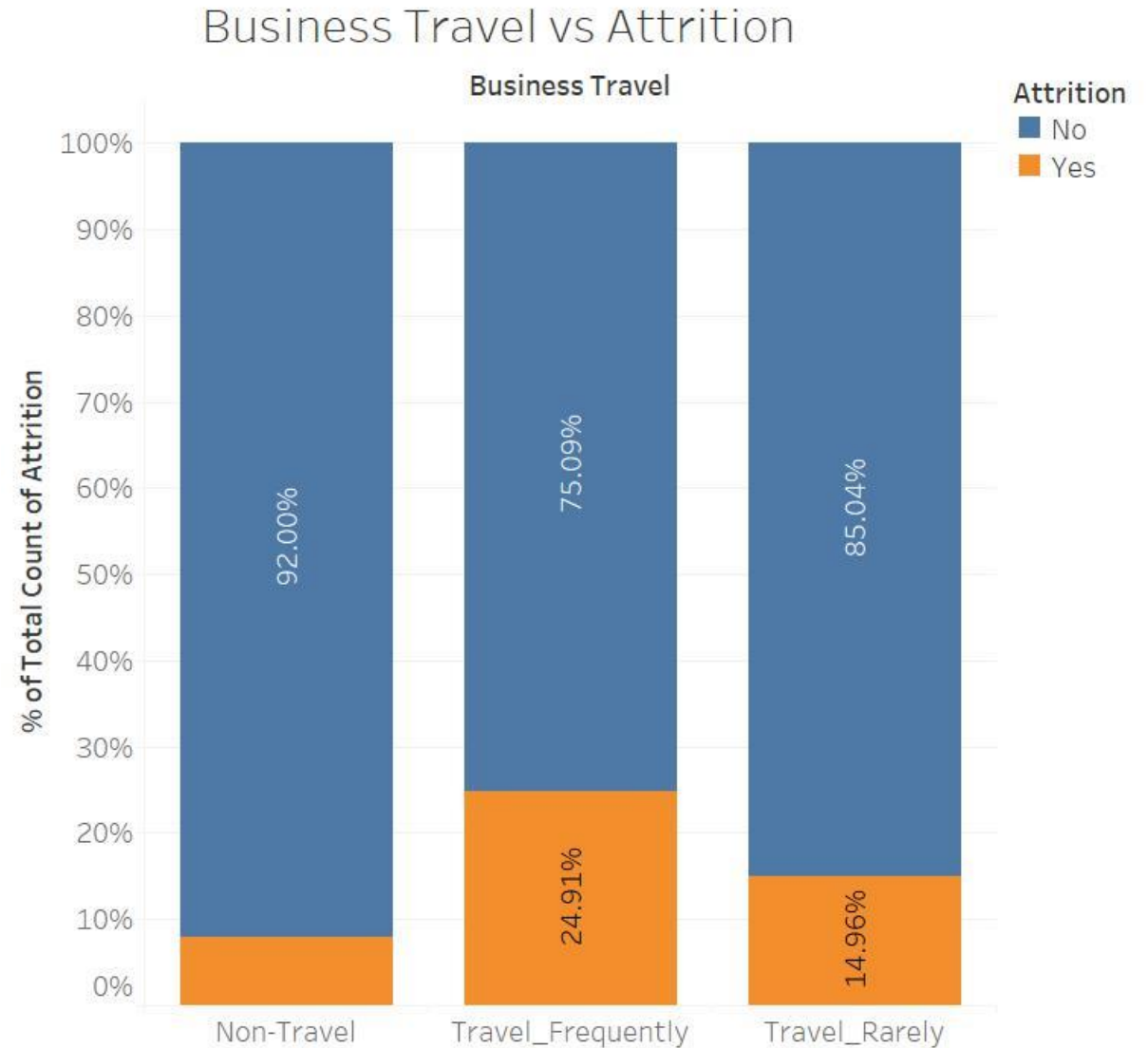
% of Total Count of Attrition for each Business Travel. Color shows details about Attrition.

Recommendations to Board

Following are the recommendations to the management:

1. The surveys should ask the right questions when trying to address the issue of attrition not take a general survey with questions like job satisfaction.

For ex., specific questions to current manager , work allocation , openness to travel , etc.

This when studied will be able to give good insights to the management.

Also , the survey should can be made specific to levels of the employee also.

2. During the hiring process , number of companies changed by time spent in each company should be one of the important factor for short listing. If the ratio is high , then the candidate should not be shortlisted as he/she will bound to be churned.

3. Look at hiring more of freshers and then try to scale them up than taking laterals as the analysis shows employees with work exp between 4-11 are high on attrition.