HR Analytics Case Study

Problem Statement

- A large company named **XYZ,** having about 4000 employees, is facing the problem of **attrition** (or employees leaving the company voluntarily or involuntarily) at the rate of 15%. The management believes such level of attrition is bad for the company and wants to understand the factors it should focus on to bring down the level of attrition.

Analysis Approach

- Using Exploratory Data Analysis, visually identify the variables having most impact on employee attrition.
- Build a model using Logistic Regression Technique to identify most important variables responsible for attrition.

Data

- Data comes from XYZ company and it comprises of
- 4410 records of employee data.
- Observations include information such as Age, Attrition, Department, Education, Salary Hike, Years in Company, Gender, Training, Marital Status etc.
- Totally 29 variables are there and a years data of employee work timings.
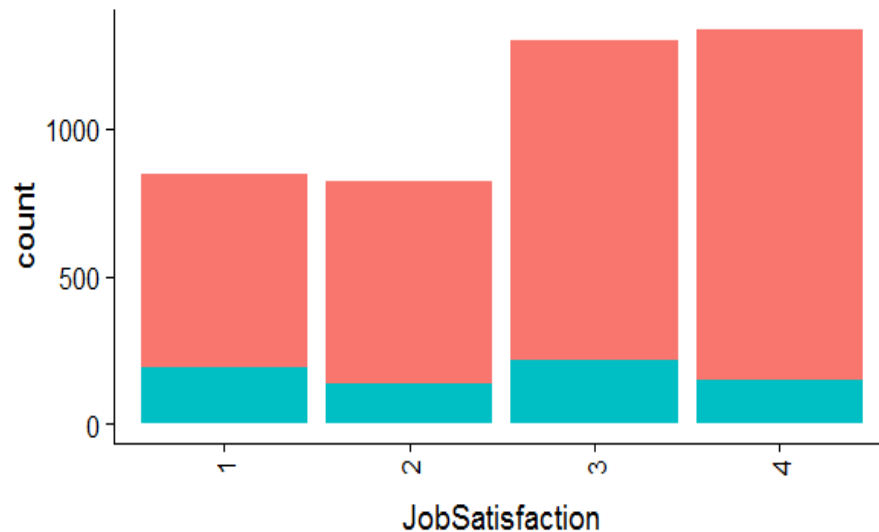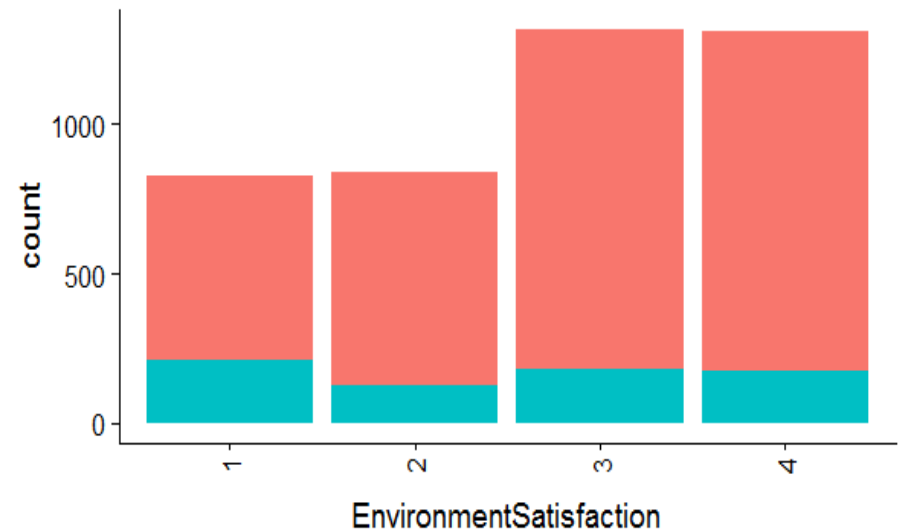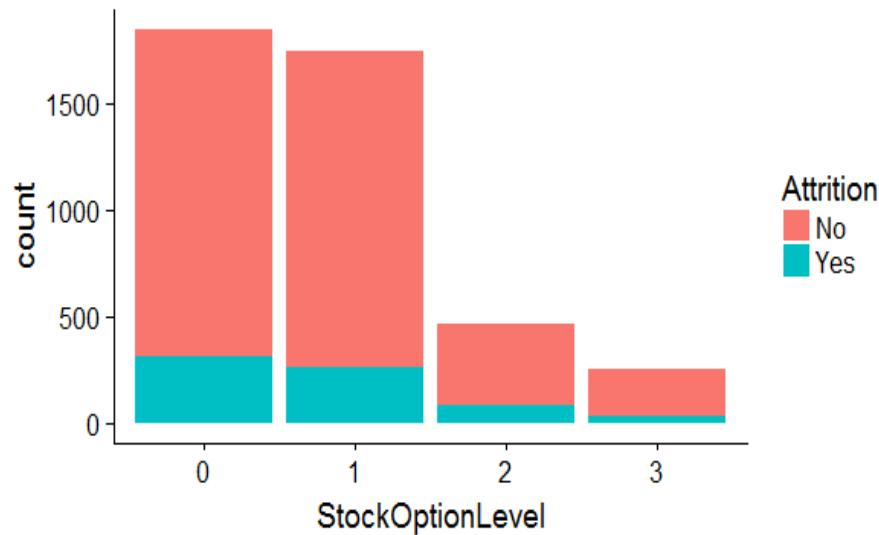
Distribution of Attrition

- As per the data, roughly 16% employees have left the company.
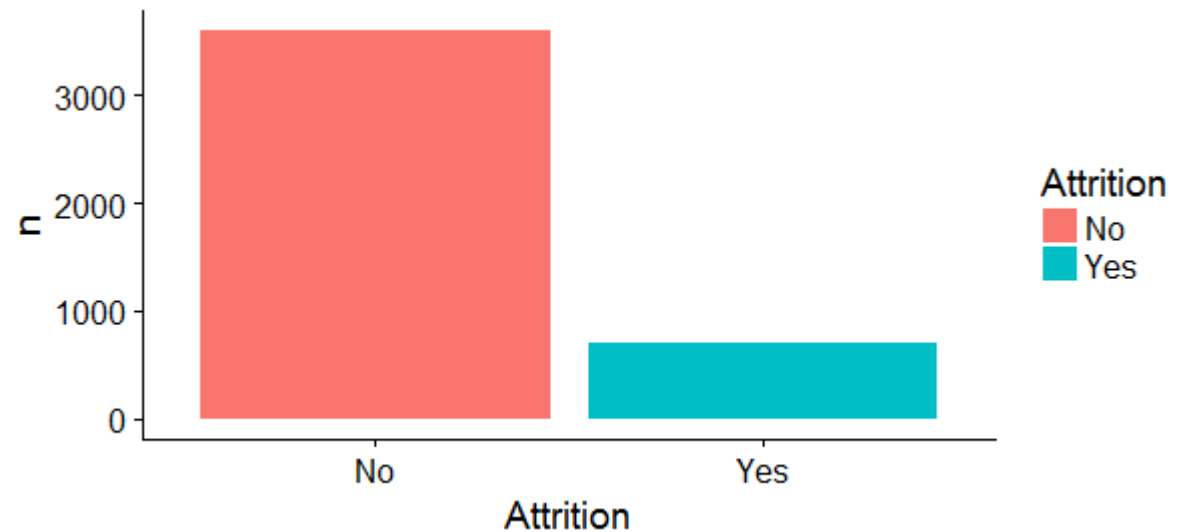
Attrition distribution by various variables
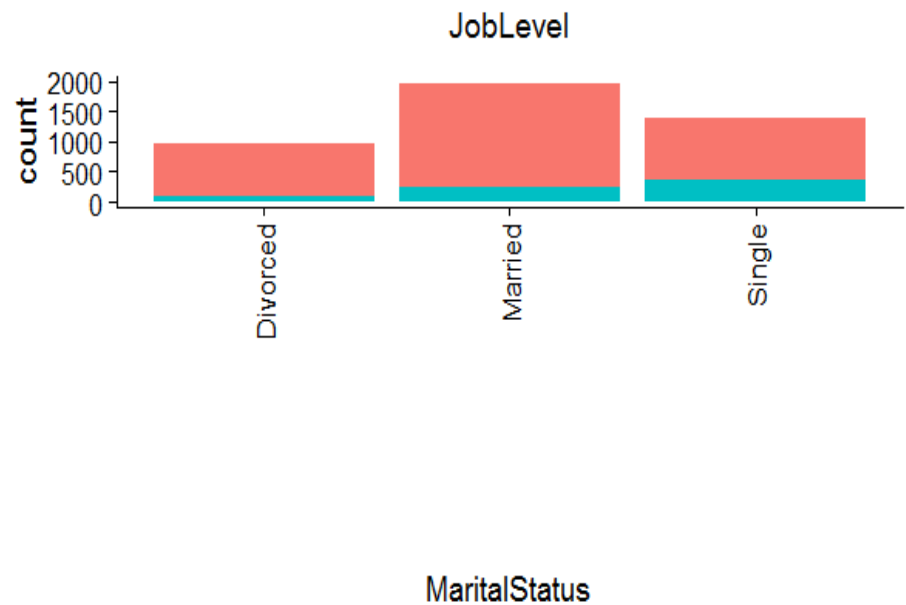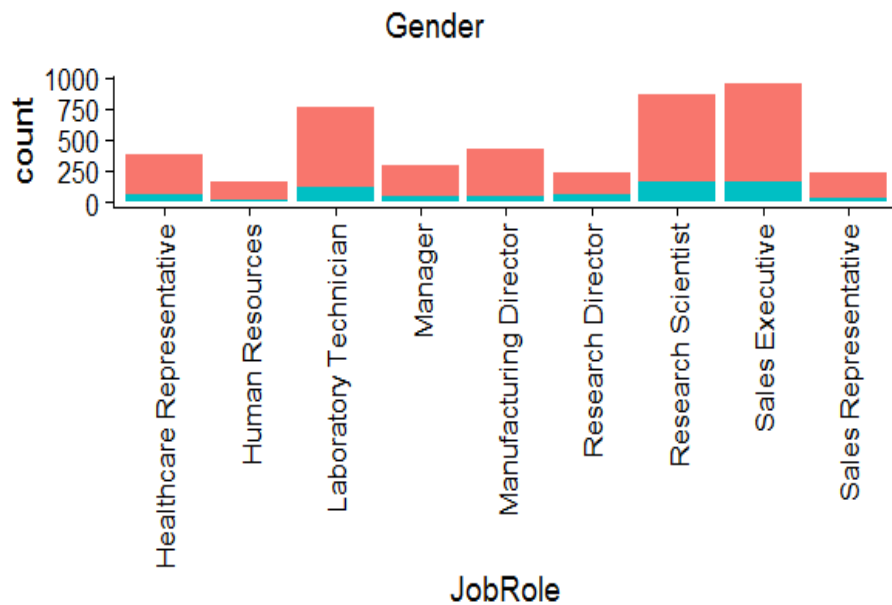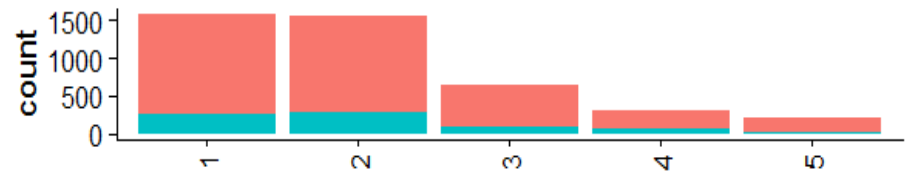
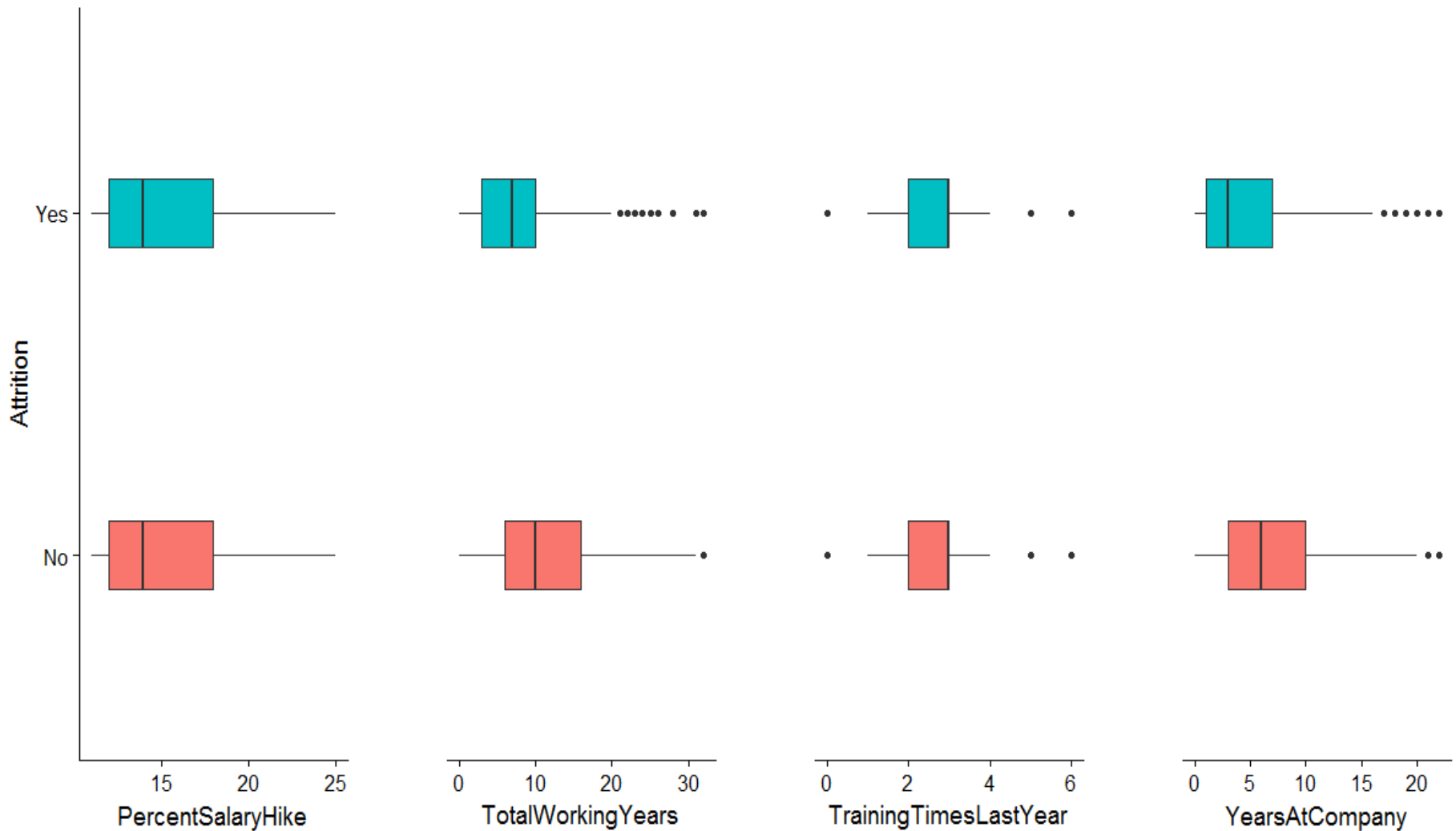# Attrition distribution by various variables

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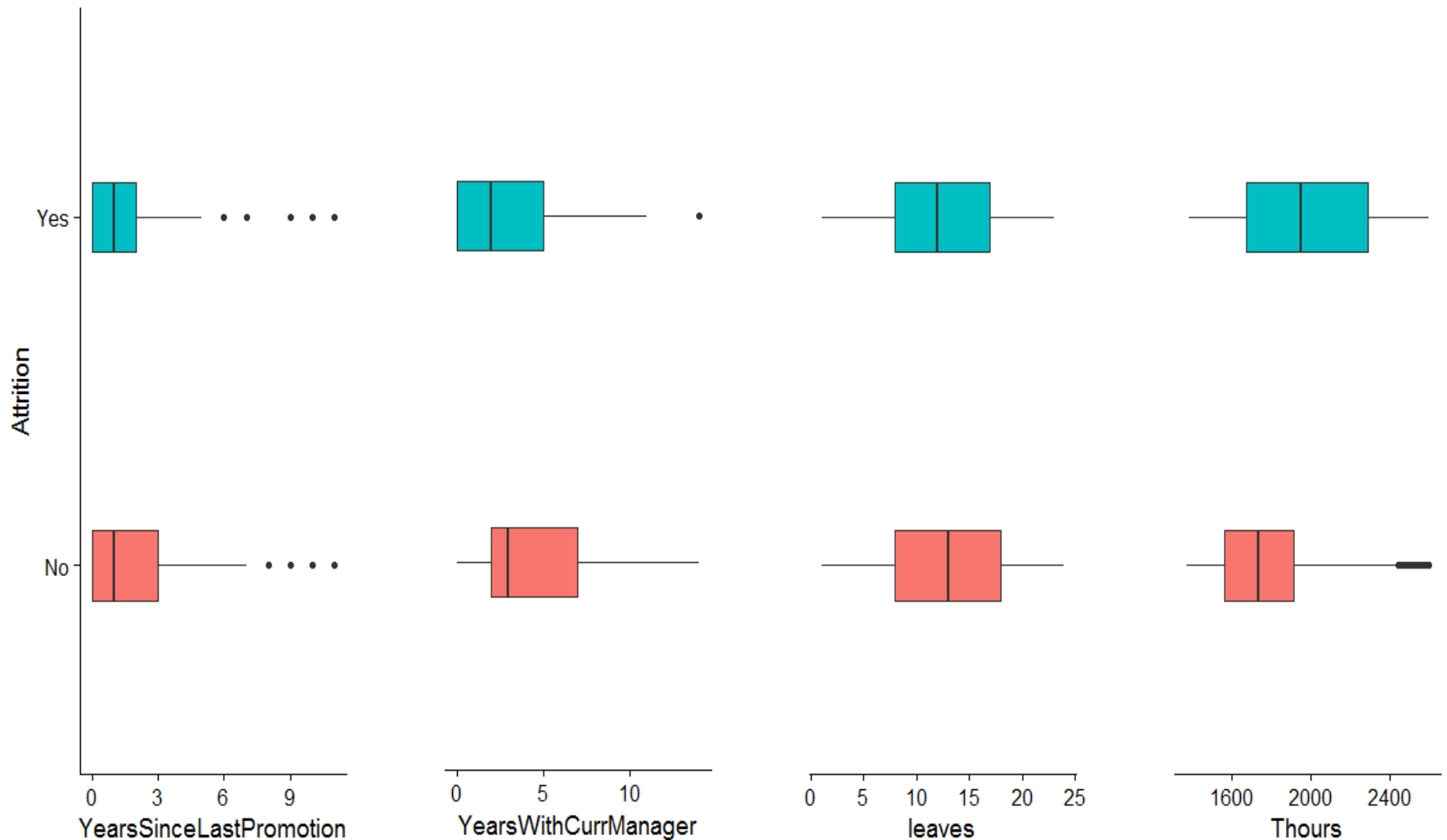
Visual Analysis Findings

- Following variables emerged as key indicators of attrition
- after visual analysis:
- 1) Job Level
- 2) Marital Status
- 3) Environment Satisfaction
- 4) Job Satisfaction
- 5) Age
- 6) Years at Company
- 7) Work hours (Total, Monthly and Daily)

Logistic Regression

A logistic regression model is created from the data.

Assumptions: 1) Columns with all missing values in in_time and out_time data are assumed to be company holidays.

2) Employees with missing values in both in_time and out_time data are assumed to be on leave.

Logistic Regression Results

Following variables emerged as significant predictors of Attrition:-

1) **Age:** Coefficient of Age is negative meaning an increase in age results in the decrease in probability of attrition of employee.

2) **Number of companies worked:** Coefficient of Number of companies worked is positive meaning more the number of companies an employee has worked in, more the probability of him/her leaving.

3) **Years Since Last Promotion**: Coefficient of Years Since Last Promotion is positive meaning more the number of years since an employee was promoted, more is the probability of him/her leaving.

4) **Years With Current Manager:** Years With Current Manager has negative coefficient meaning more the number of years an employee has spent with his/her current manager, lesser the probability of him/her leaving.

5) **Average Monthly Hours:** Average Monthly Hours has positive coefficient meaning more the average monthly hours of an employee, more is he/she likely to leave

Logistic Regression Results

- 6) **BusinessTravel.xTravel_Frequently:** This variable has positive coefficient. So, an employee who has to travel frequently for business has a higher probability of leaving than an employee who does not travel.

- 7) **MaritalStatus.xSingle:** This variable has positive coefficient. So, an employee who is single has a higher probability of leaving than a married employee.

- 8) **Environment Satisfaction**: This variable has negative coefficient for increasing levels of 2,3, and 4. So, an employee who has a medium, high or very high work environment satisfaction level is less likely to leave than an employee whose satisfaction level is low.

- 9) **Job Satisfaction:** This variable has negative coefficient for highest level 4 meaning an employee whose job satisfaction level is very high is less likely to leave.

Top factors in decreasing order of Impact

- Based on their coefficient values, the factors can be ranked in decreasing order of their impact as:
- **1) Environment Satisfaction**
- **2) Marital Status**
- **3) Job Satisfaction**
- **4) Average Monthly Hours**
- **5) Frequent Business Travel**
- **6) Years With Current Manager**
- **7) Age**
- **8) Years Since Last Promotion**
- **9) Number of companies worked**

Recommendations

- 1) It is recommended that management takes immediate steps to improve the Work Environment Satisfaction level of employees as highly satisfied employees are much less likely to leave and there are 700+ employees who have reported low levels of work environment satisfaction.

- 2) Other steps that can be taken are:-

- (i) Improving Job satisfaction levels,

- (ii) Reducing Average Monthly hours of employees,

- (iii)Reducing Business related travel of employees who travel frequently.

- (iv) See the possibility of promotions of employees who have not been promoted for a long time.