HR Analytics Case Study

SUBMISSION

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Business Problem

A large company named **XYZ**, employs, at any given point of time, around 4000 employees. However, every year, around 15% of its employees leave the company and need to be replaced with the talent pool available in the job market. The management believes that this level of **attrition**(employees leaving, either on their own or because they got fired) is bad for the company, because of the following reasons -

1.The former employees' projects get delayed, which makes it difficult to meet **timelines**, resulting in a reputation loss among consumers and partners

2.A sizeable department has to be maintained, for the purposes of **recruiting** new talent

3.More often than not, the new employees have to be **trained** for the job and/or given time to acclimatize themselves to the company

Aim

The aim of analysis is to identify the root cause of the problem

- Driving factors (or driver variables) behind Attrition of employee
- Inferential analysis on the various attributes which effect attrition of a employee
- Building model for predictive analysis based on given data

Problem solving methodology

- Business understanding
- Data Understanding
- Data clean-up and correction
  - Univariate
  - Bi-variate
  - Muti-variate and Derived Metrics
- Data Analysis and Inferences
- Model Building
- Model Evaluation
- Recommendations

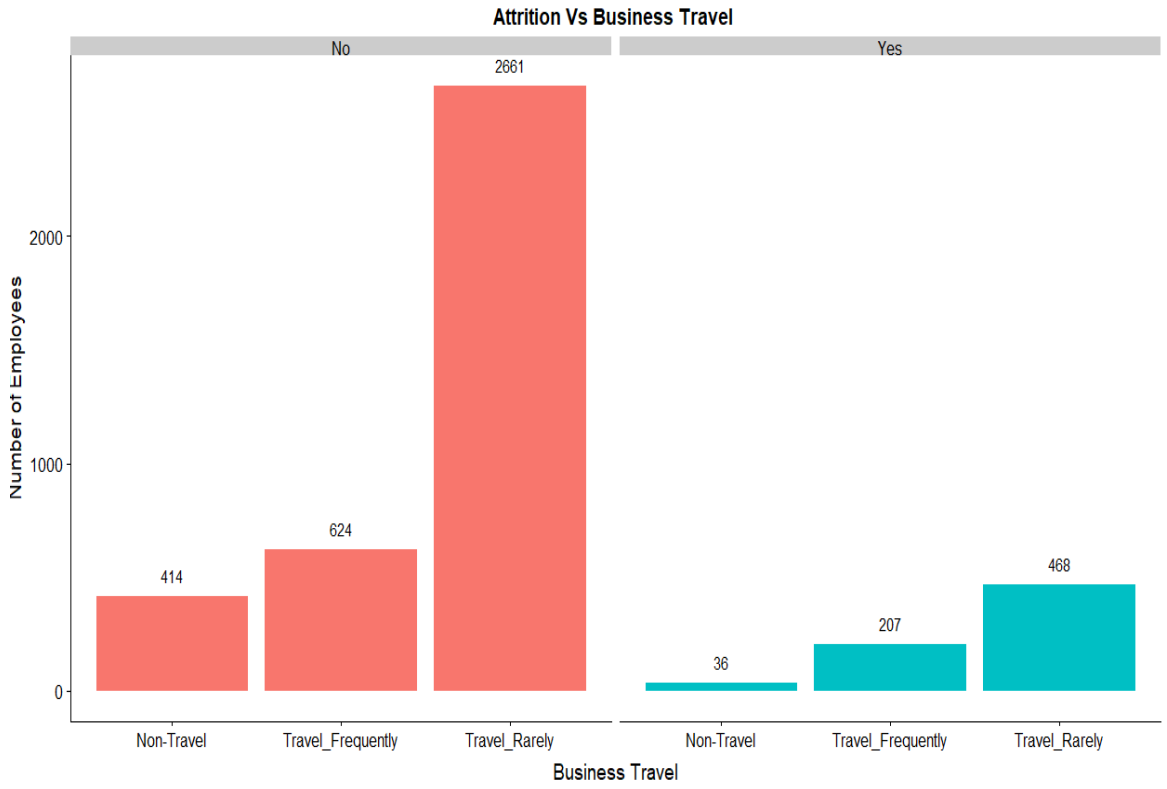
Data Understanding

- Data Given in 4 sets
  - ✓ In time
  - ✓ out time
  - ✓ General Data
  - ✓ Surveys- include Management Data and Employee Survey data

- Data Analysis
  - Inferential Statistics to be applied on (Attrition , which is dependent variable on other independent variables)
  - Predictive Analytics to be developed based on building a optimized model
  - The data will be divided in “Tran” data and “Test “ data
  - Based on given data- some of the categorical variables are grouped fror Visualization and analysis

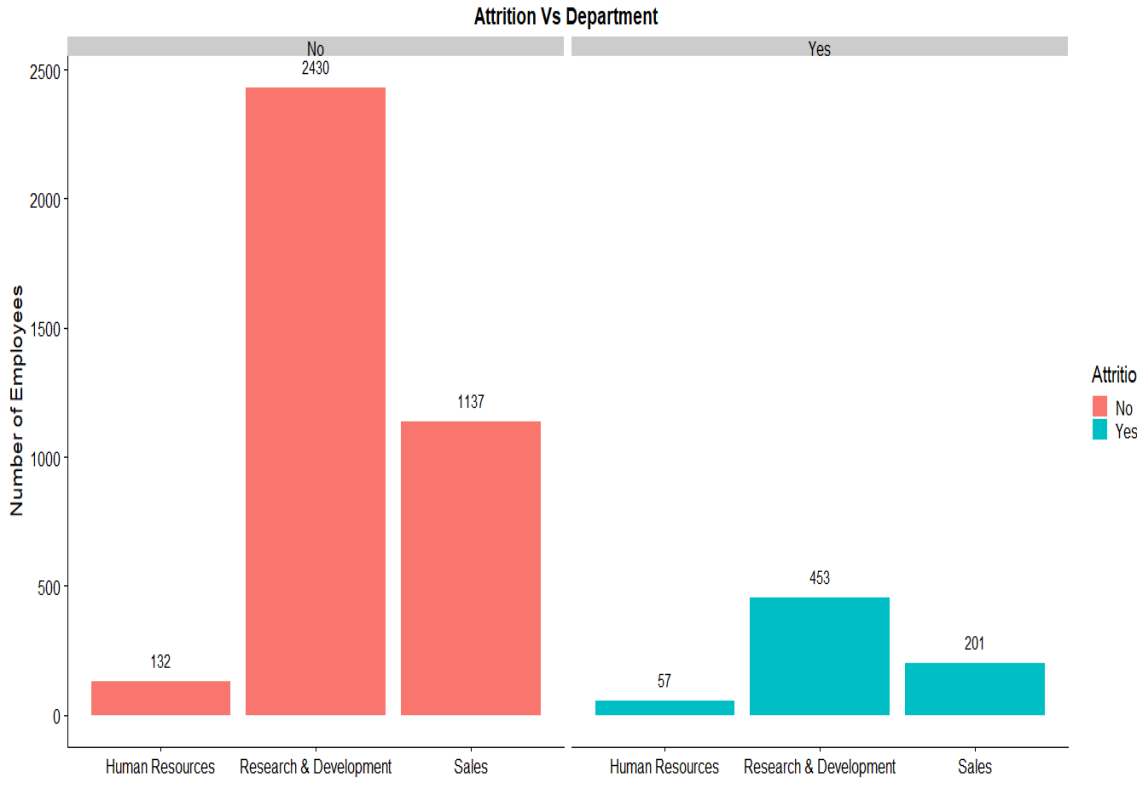
Data Visualization

Attrition Vs Business Travel



"Travel ready" has contributed 68 % of Attrition

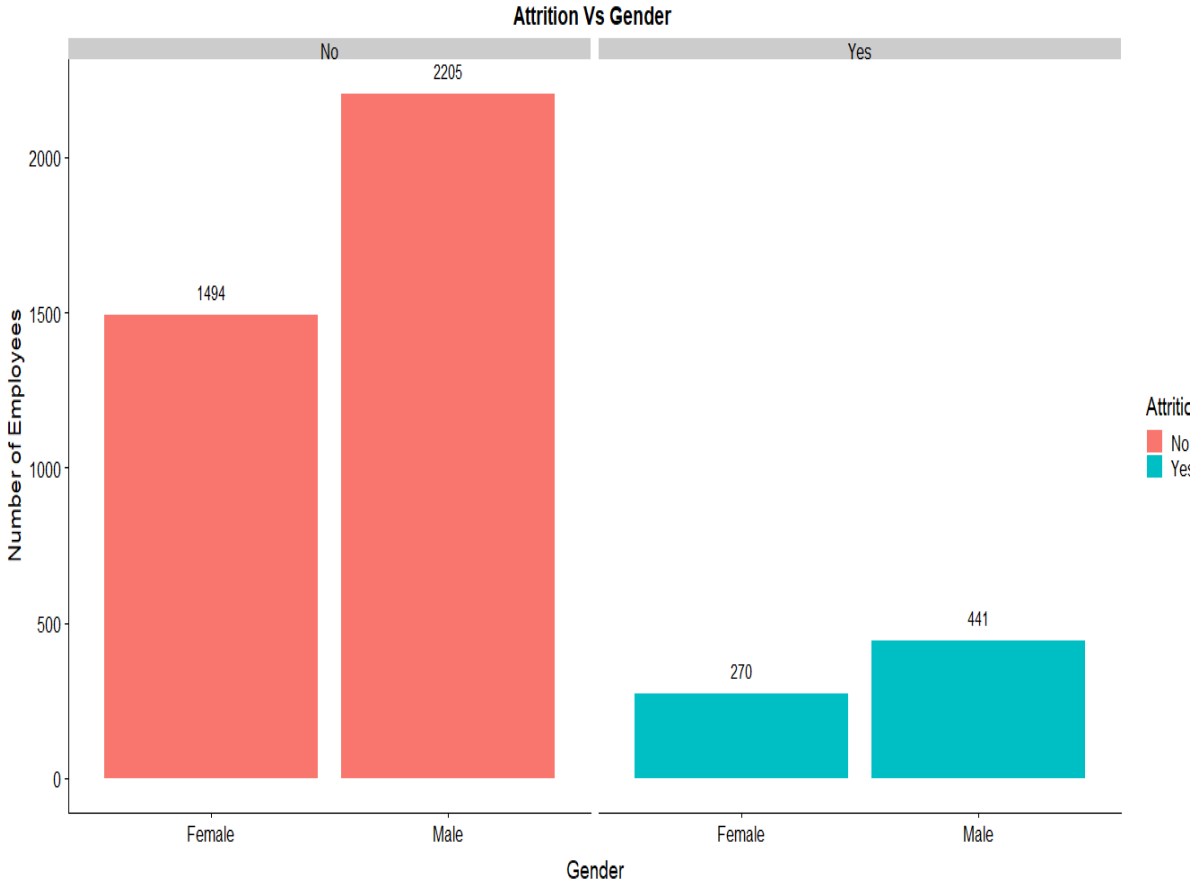
Attrition Vs Department



R& D -Department has more Attrition rate with 64%n rate

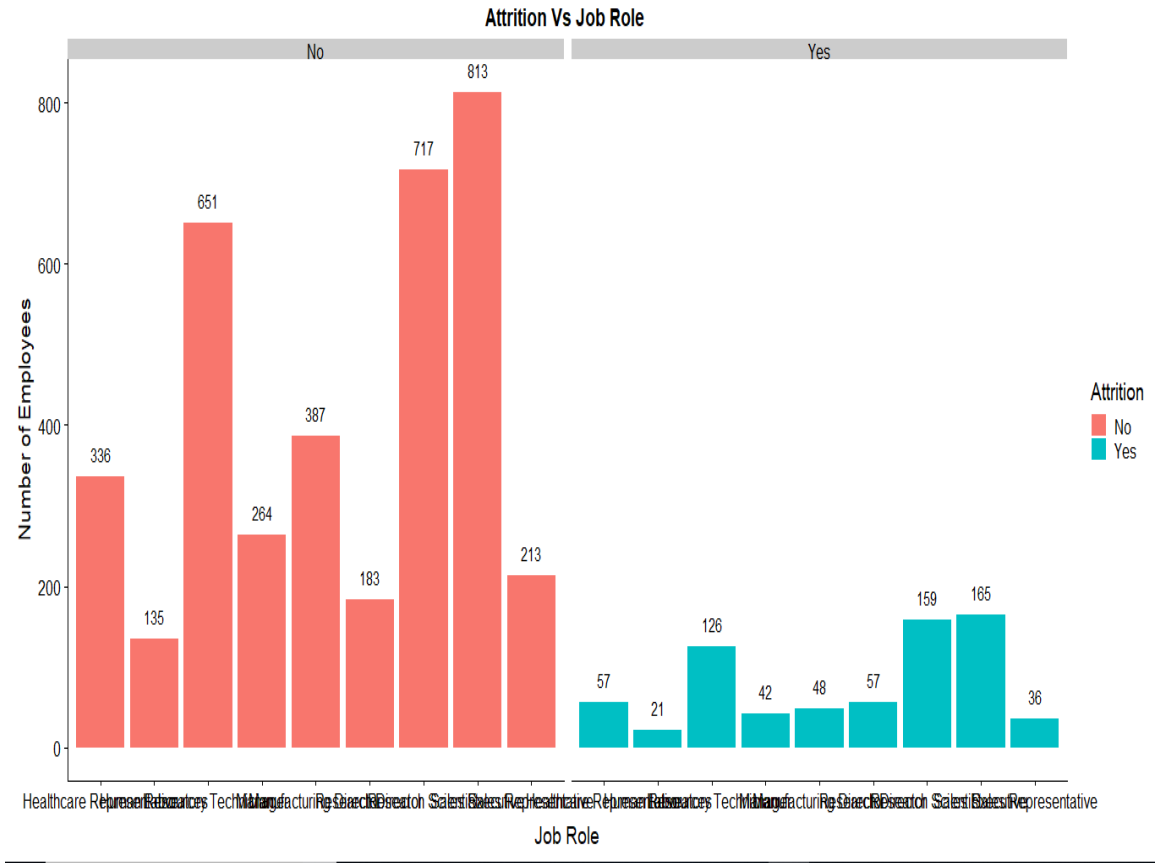
Data Visualization

Attrition Vs Gender



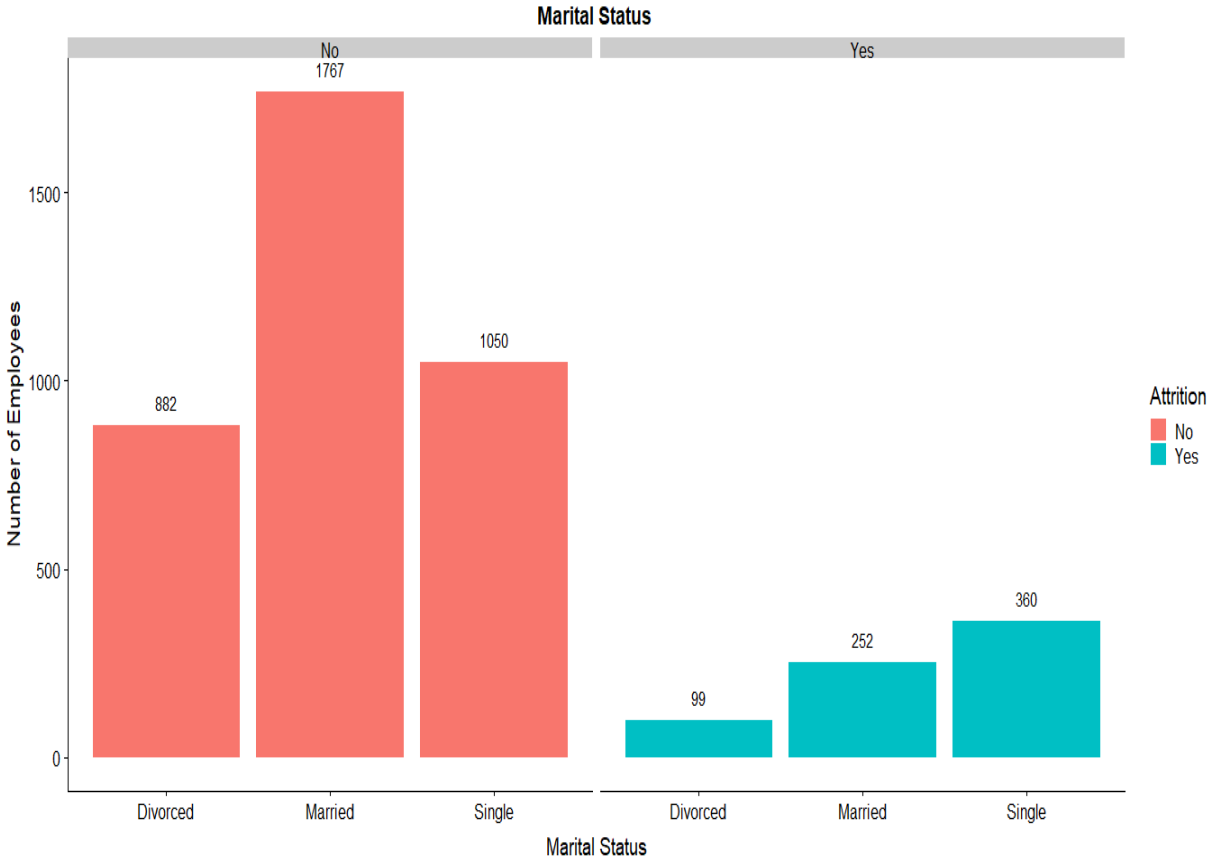
62% who left the organization are male employees

Attrition Vs Job Role



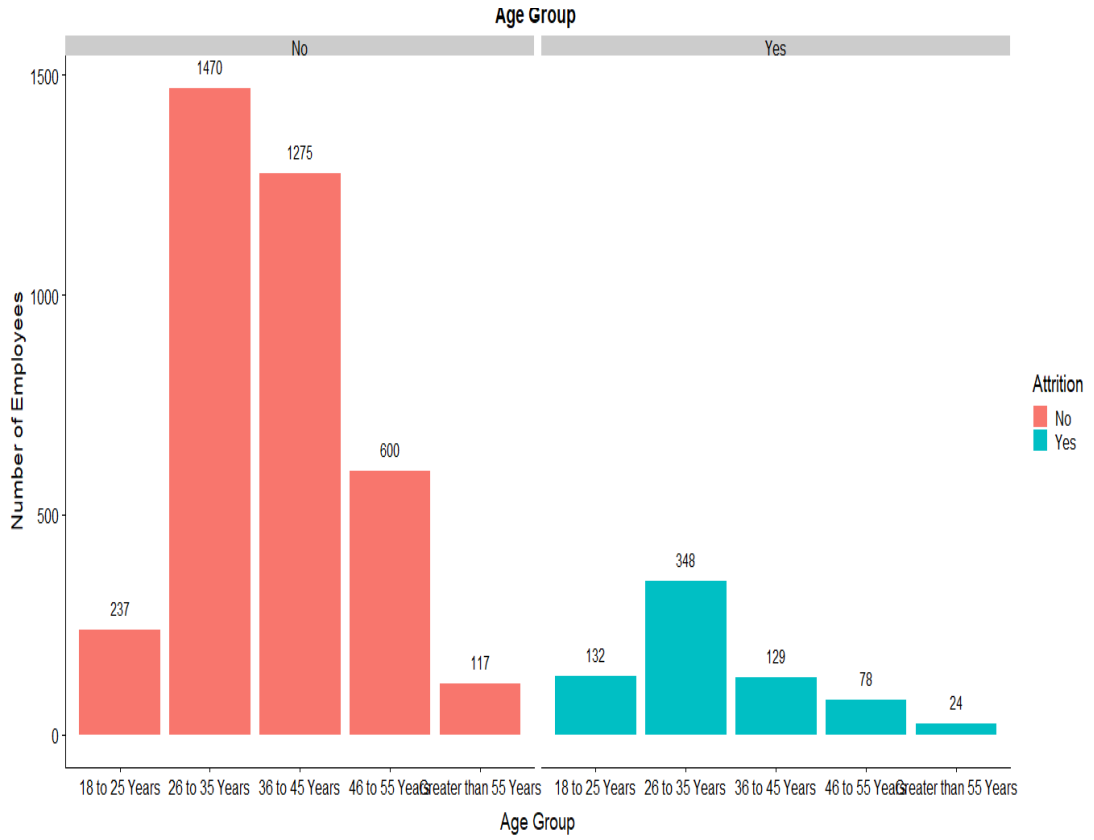
Data Visualization

Attrition Vs Martial Status



50% who left organization are "Single"

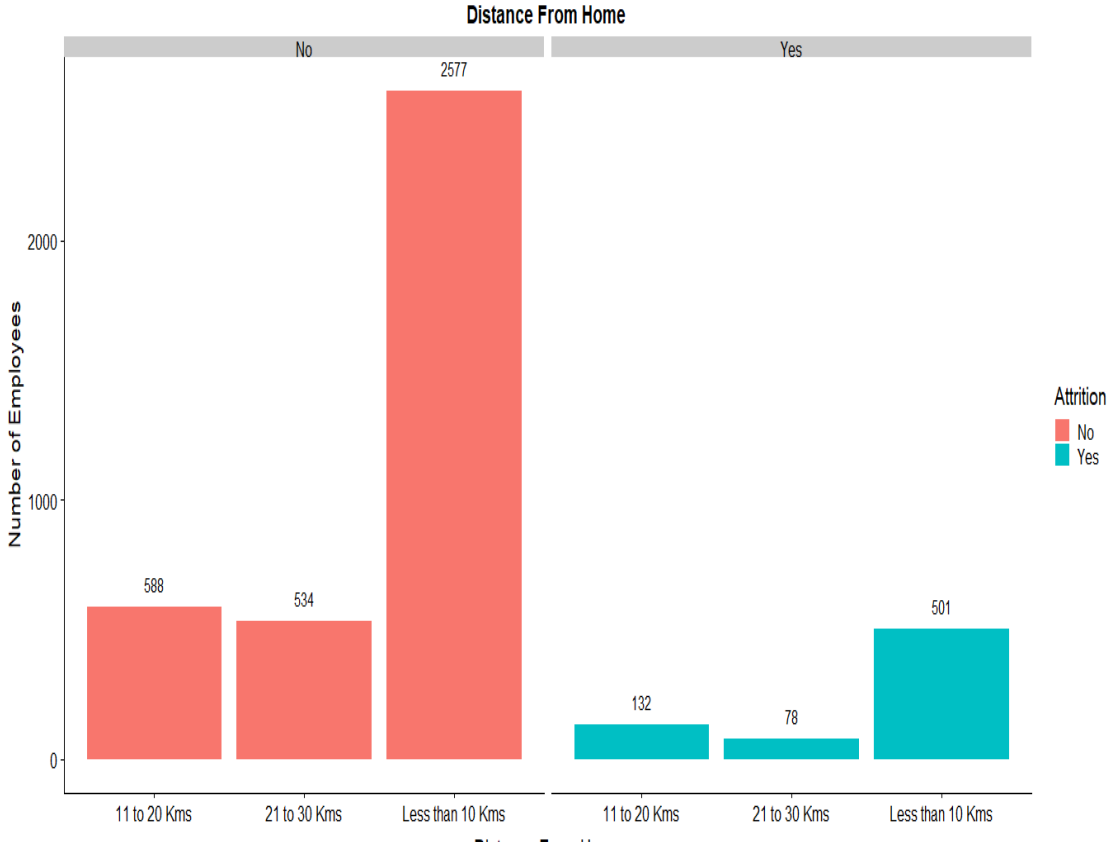
Attrition Vs Job Age Group



50 % of employees who left organization are falls in the "Age Group" "26 to 35 Years"

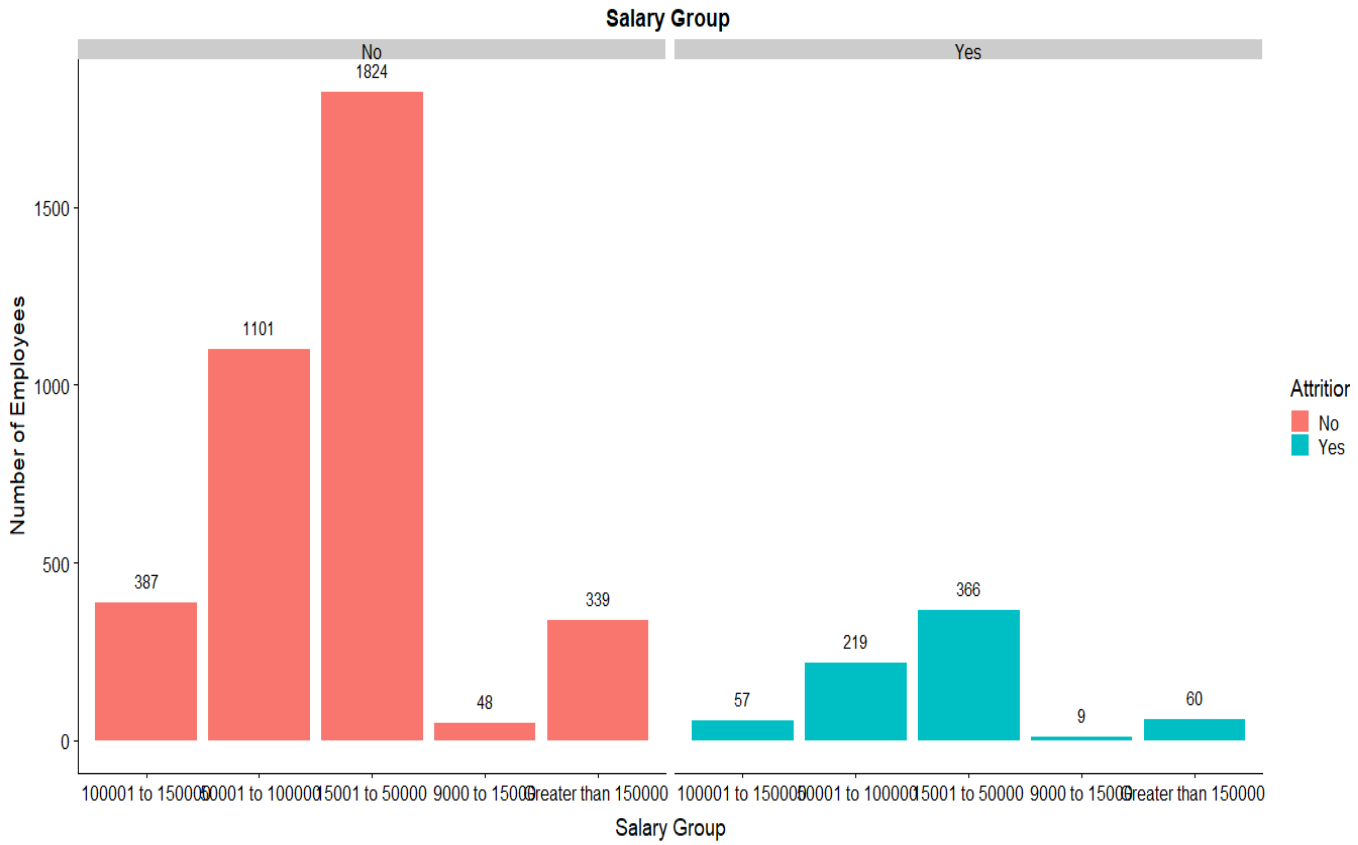
Data Visualization

Attrition Vs Distance from home



Nearly 70 % of employees who left company are below 10 kms from office "

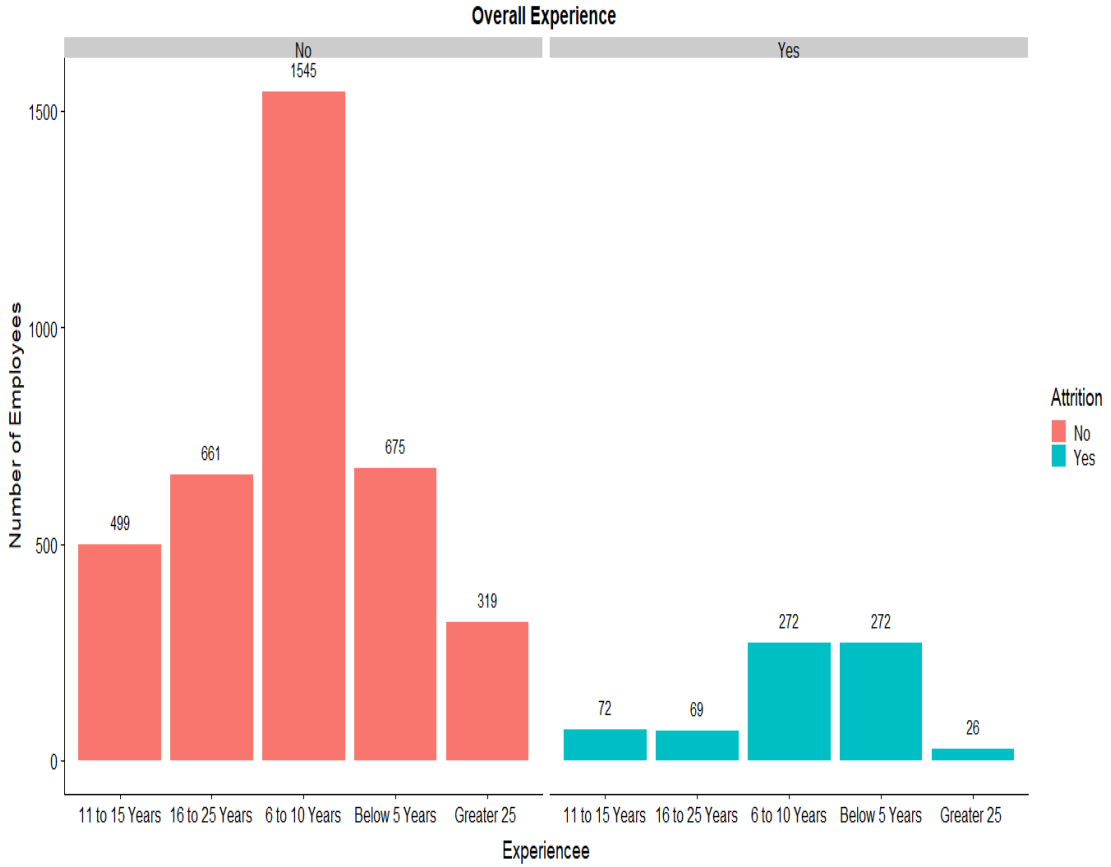
Attrition Vs Salary group



50 % of attrition is noted in the salary group " 50,000 to 1,00,000"

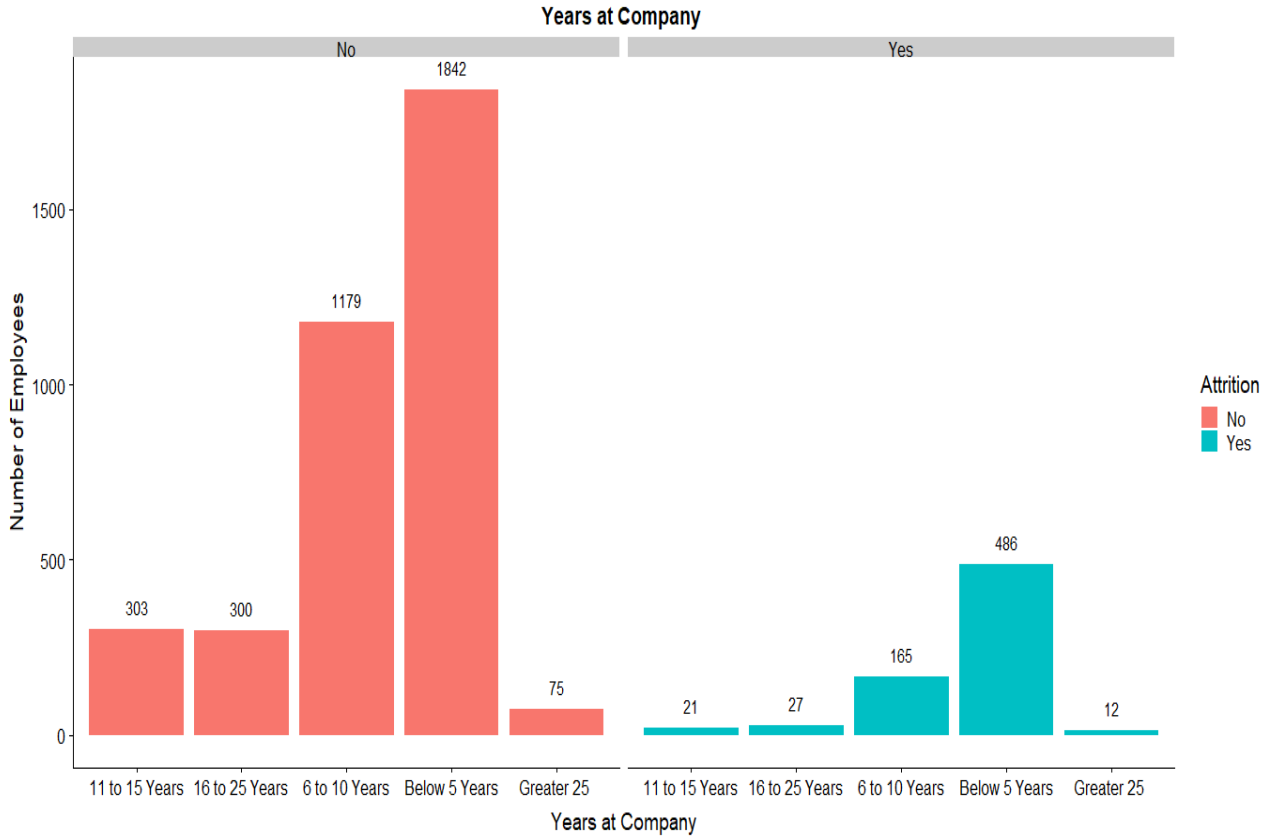
Data Visualization

Attrition Vs Experience



75 % of employees who left organization are with experience less than “10 years "

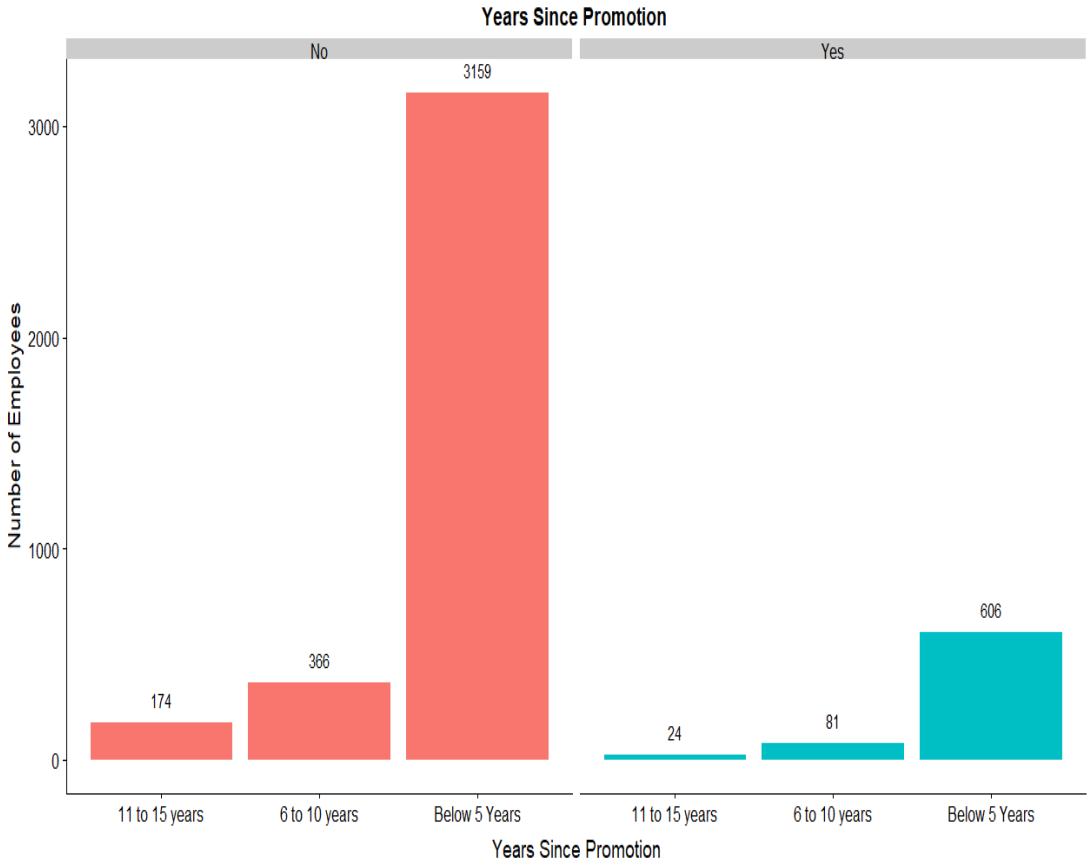
Attrition Vs Current company experience



More attrition 1.e, 68% was found in the employees who works below 5 years for the company

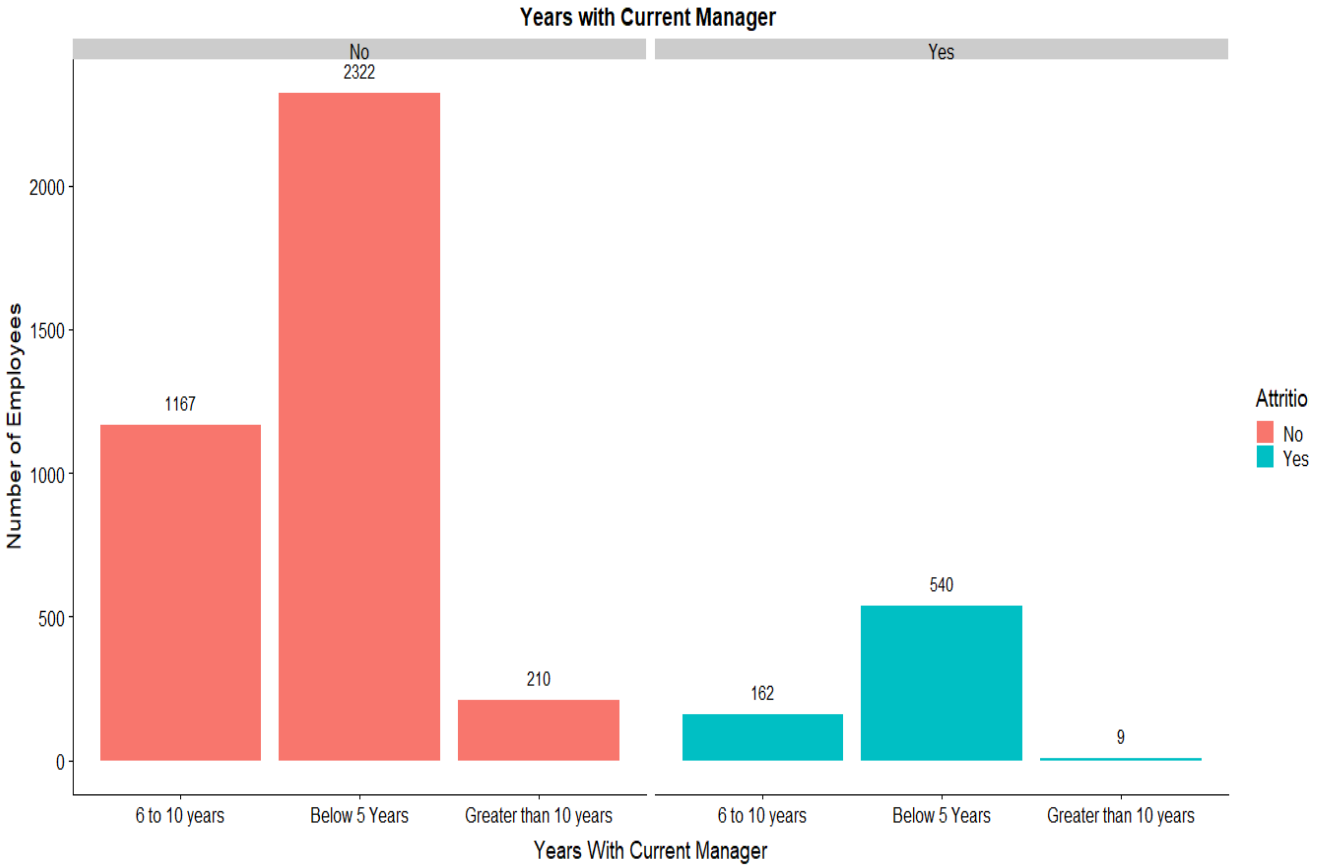
Data Visualization

Attrition Vs Since Promotion



Employees who are not promoted within 5 years have attrition rate with 85%

Attrition Vs Years with Current Manager

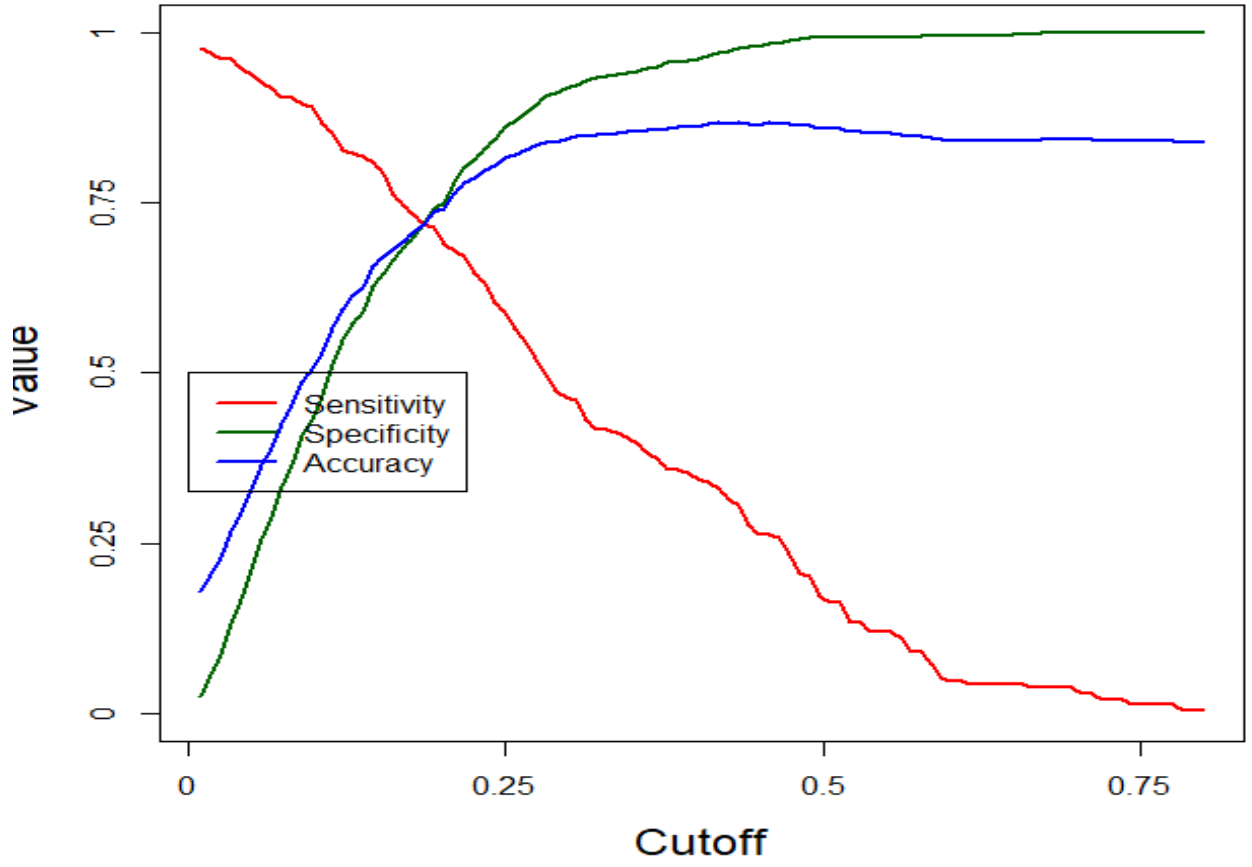


Employees who are with same manager with in 5 years have more attrition rate with 76 %

Final model Analysis

	Estimate	Std. Error	z v	Pr(>|z|)	
(Intercept)	3.060269	0.475836		1.26e-10	***
EnvironmentSatisfaction	-0.247627	0.048251	-	2.87e-07	***
JobSatisfaction	-0.278823	0.048350	-	8.08e-09	***
WorkLifeBalance	-0.306619	0.074935	-	4.28e-05	***
Age	-0.029932	0.008354	-	0.000340	***
NumCompaniesWorked	0.113318	0.023125		9.57e-07	***
TotalWorkingYears	-0.056964	0.014818	-	0.000121	***
YearsAtCompany	-0.084055	0.019493	-	1.62e-05	***
YearsSinceLastPromotion	0.178296	0.025060		1.12e-12	***
BusinessTravel.xTravel_Frequently	0.687894	0.126038		4.82e-08	***
EducationField.xLife.Sciences	-1.478381	0.312421	-	2.22e-06	***
EducationField.xMarketing	-1.482768	0.341813	-	1.44e-05	***
EducationField.xMedical	-1.533636	0.315653	-	1.18e-06	***
EducationField.xOther	-1.874691	0.389481	-	1.48e-06	***
EducationField.xTechnical.Degree	-1.831005	0.359904	-	3.63e-07	***
MaritalStatus.xSingle	0.805175	0.109019		1.52e-13	***

Model evaluation



The optimal cut off for probability is 18 %

Confusion Matrix and Statistics

	Reference	
Prediction	No	Yes
No	761	57
Yes	320	152

Accuracy	: 0.7078
95% CI	: (0.6821, 0.7325)
No Information Rate	: 0.838
P-Value [Acc > NIR]	: 1

Kappa	: 0.2861
Mcnemar's Test P-Value	: <2e-16
Sensitivity	: 0.7273
Specificity	: 0.7040
Pos Pred Value	: 0.3220
Neg Pred Value	: 0.9303
Prevalence	: 0.1620
Detection Rate	: 0.1178
Detection Prevalence	: 0.3659
Balanced Accuracy	: 0.7156

Recommendations

- **Low Work Environment Satisfaction has a strong factor for employee attribution. Company has to improve on this factor and make necessary changes**
- **Job Satisfaction is also important factor in affecting attrition rate, therefore company has to take improvement plans to build morale of the employee, such as motivational activities**
- **As Work life balance is a strong indicator, there should proper measures to be taken for employees such as Work plans, un biased shift roaster, work from home facilities etc**
- **It has been observed that employees below 35 years have more attrition rate, may be because of high opportunities out side, with higher salary hikes, therefore company has to consider correction of Salary based on industry standards**
- **Also to be considered years of experience and plan the promotions, performance rating etc**
- **It is inferred that high level of attrition were observed in the field of Medical, Marketing, Technical, therefore the company has to address the reasons in these fields and take appropriate actions**

THANK YOU