HR ANALYTICS CASE STUDY

COURSE 3 | GROUP PROJECT 1

GROUP MEMBERS

1. Madhavi Ayyagari
2. Harsha Ajmera
3. Anish Sukhathankar
4. Anish Roy

ANALYSIS OBJECTIVE

1. To understand the factors for the 15% attrition in the company XYZ.
2. Analyse the factors and report the ones which have to be addressed right away and provide solutions to curb them, in order to get most of their employees to stay.

DATA INPUTS

1. Demographic profile of the employees
2. Employee work profile data
3. In time and Out time data
4. Employee participation data

Data provided as 5 different files

1. Employee survey data
   Information on employee's perspective
2. Manager survey data
   Employee work profile as per manager
3. In time and 4. Out time
   Timestamps of employee coming to work and leaving the office
4. General data
   Employees demographic details

ANALYSIS METHODOLOGY

1. DATA CLEANING

1. Merging the data from different sources into a common dataframe for analysis
2. Handling the missing/NA values
3. Formatting date and time for analysis
4. Grouping in time and out time data
5. Identifying and treating outliers in data

2. UNIVARIATE AND MULTIVARIATE

1. Understanding the variables
2. Finding relationship among the variables through plots and their implication on other variables

3. MODEL BUILDING

1. Creating dummy variables for categorical variables
2. Scaling the continuous variable to reduce deviation
3. Build logistic regression model for attrition categorical variable

4. TESTING THE MODEL

1. Testing the model using the test dataset for determining accuracy, specificity and sensitivity – Confusion matrix

5. REMODELLING

1. Checking the results and remodelling if the results are not acceptable.
2. If the results are acceptable the final model is declared

6. FINAL MODEL

CONSIDERATIONS FOR ANALYSIS

FOR DATA CLEANING

Merged General, Employee Survey, Manager Survey & Employee with work hours had NA values in following columns

No. of Companies Worked = 19

Environment Satisfaction = 25

Job Satisfaction = 20

Work Life Balance = 38

Total Working Years = 9

For No. of Companies Worked & Total Working Years total 28 out of 4410 which is 0.006349206

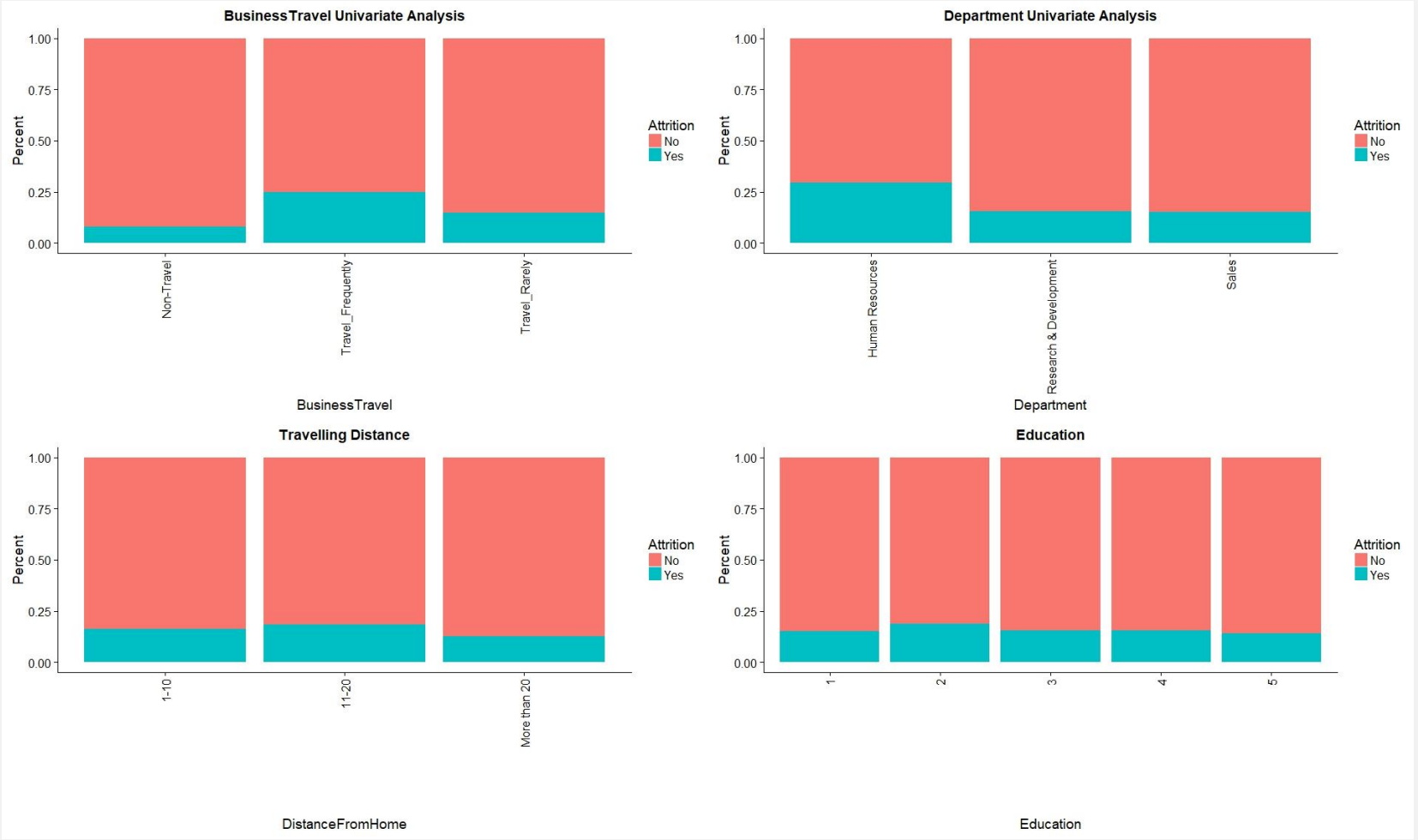
So its 0.6%, capping this value to its mean median or mode better to delete this records

EXPLORAORY DATA ANALYTICS

BUSINESS TRAVEL AND DEPARTMENT

Inference

1. People from HR department who have travel distance of 11 –20 km with higher frequency are most likely churn out.

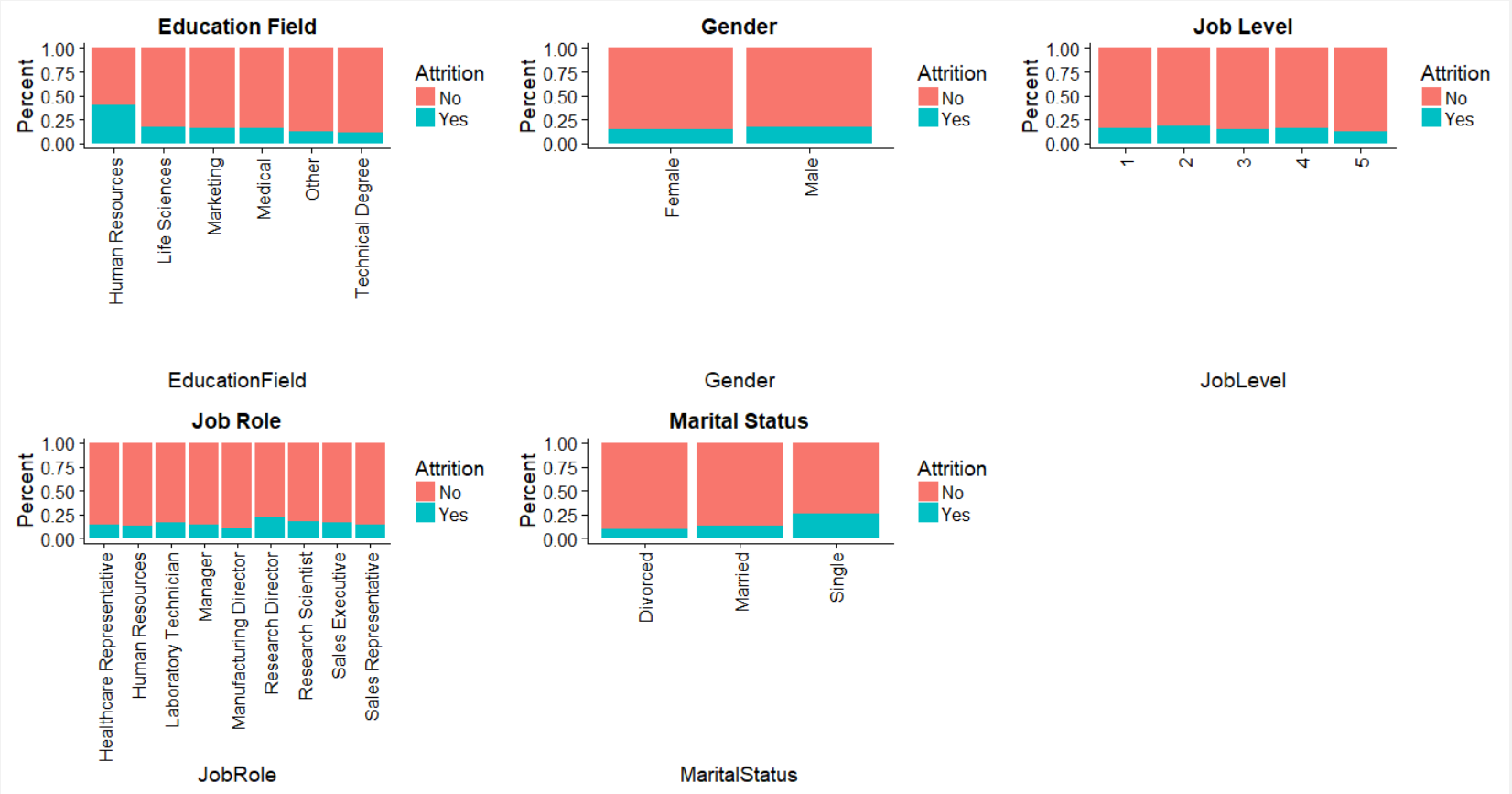


EXPLORAORY DATA ANALYTICS

EDUCATION, GENDER, JOB LEVEL, JOB ROLE AND GENDER

Inference

1. People with Human resources as their education background churn most
2. Gender wise churning rate is similar
3. There is negligible difference in churning rate for people at job level 1 to 4
4. People in sales and Higher job levels have high churn rate compared to others
5. People who are single have more churn rate compared to others



EXPLORAORY DATA ANALYTICS

NO. OF COMPANIES WORKED, SALARY, STOCK OPTION, WORKING YEARS, TRANING AND YEARS AT COMPANY

Inference

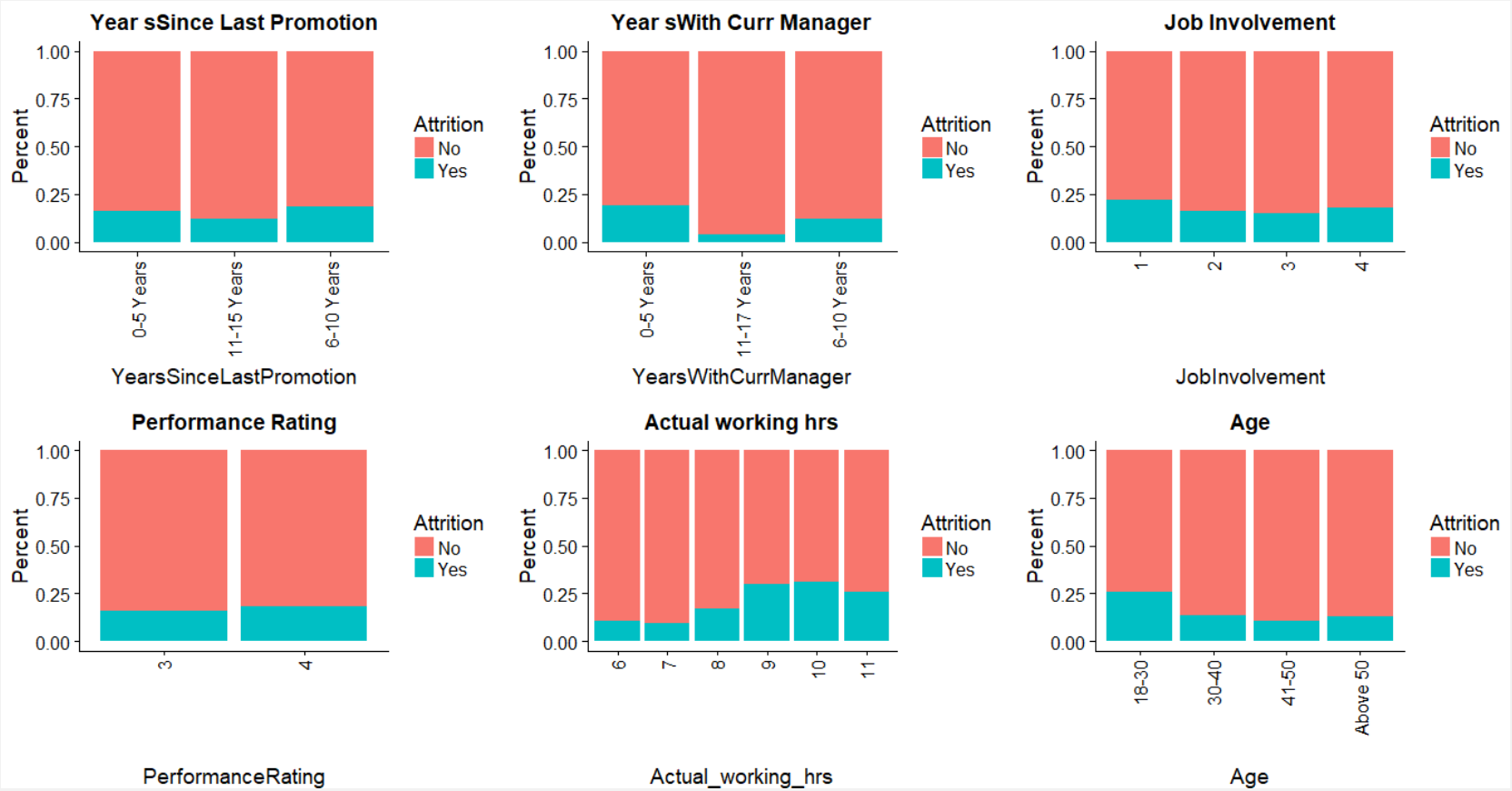
1. People who have worked in 4 to 7 and or more than 7 companies churn the most
2. People who have got highest hike left the firm
3. Stock option doesn't affect the churn much
4. People with less than 10 years of experience at the company or otherwise have highest rate of churning. Also who were working for more than 30 years have left the firm, may be because they might have retired
5. People who have been given 2 or 3 times training or no training have churned the most

EXPLORAORY DATA ANALYTICS

LAST PROMOTION, CURRENT MANAGER, JOB INVOLVEMENT, PERFORMANCE RATING, ACTUAL WORKING HOURS AND AGE

Inference

1. Derived column Actual working hours gives us important insight that people with long working hours churns the most
2. People who are in their 20's or late 20's leave the company most
3. People with either low or very high involvement in job churns the most
4. Surprisingly highest rating doesn't convince employee to stay at the company
5. Variance between year since last promotion is very less.
6. People who are working with manager for less than a year leaves the most



Now, we can say that following are the factors which are affecting attrition the most:

AGE	DEPARTMENT	JOB ROLE
EDUCATION FIELD	YEARS AT COMPANY	ACTUAL WORKING HOURS
MARITAL STATUS	BUSINESS TRAVEL	YEARS WITH CURRENT MANAGER

LOGISTIC REGESSTION

MODELLING AND EVALUATION

MODELLING:

Training data consists of 70% of the total data

Arrived at the final model where each variable has p-value is below 0.05 and further removing the variable with one star but value is less than 0.05
Thus, AIC as well increases significantly like by 2.0

EVALUATION

Test data consists of 30% of the total data

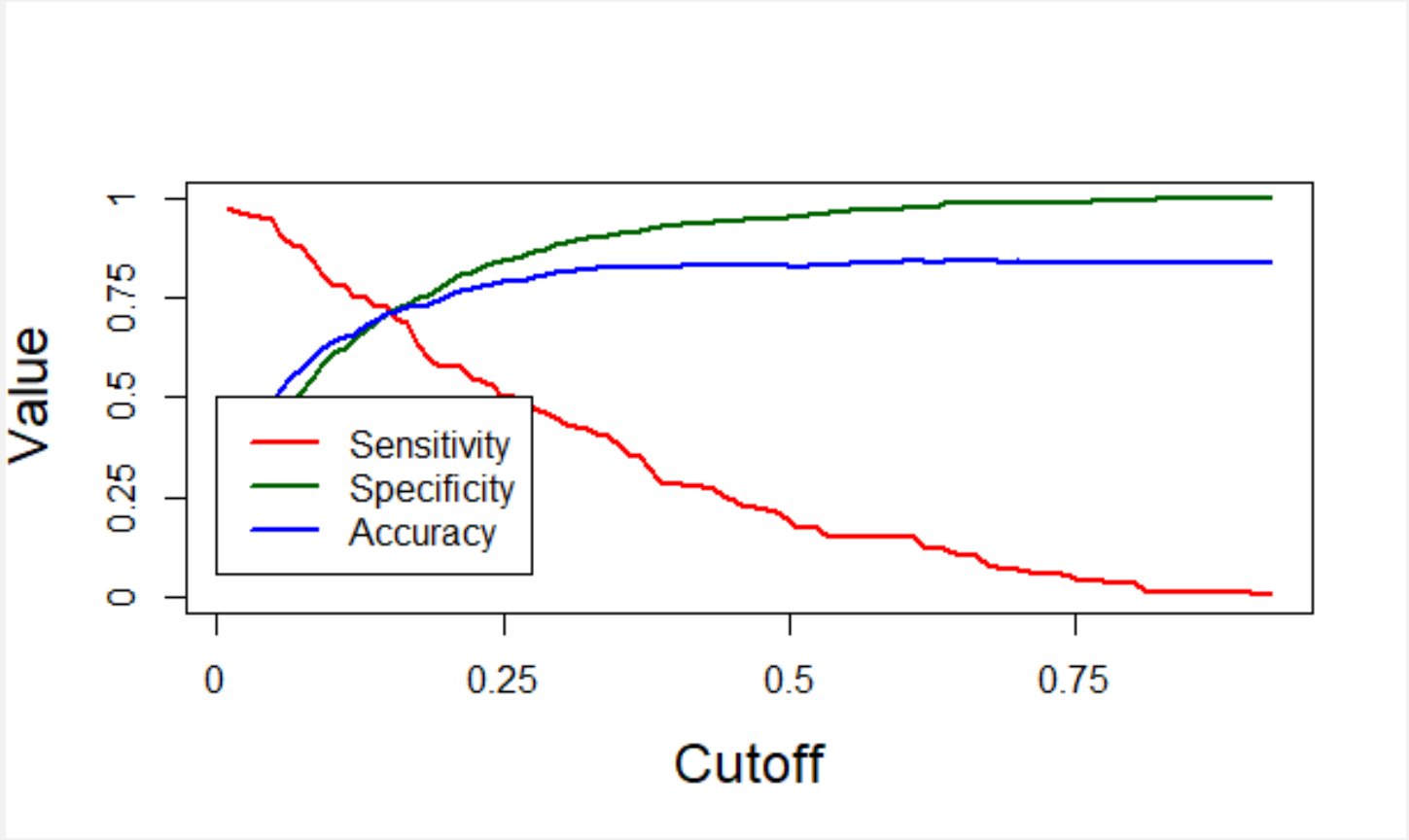
For business objective we need balance in accuracy, sensitivity and specificity for prediction.

SENSITIVITY, SPECIFICITY AND ACCURACY

FINAL MODEL SUMMARY:

Accuracy : 71%
Sensitivity: 73%
Specificity : 71%

With this model we achieve better result in terms of accuracy, sensitivity and specificity.



FACTORS HIGHLY AFFECTING PEOPLE TO LEAVE THE FIRM

BASED ON THE MODEL DEVELOPED

BUSINESS TRAVEL :

TRAVEL FREQUENTLY

DEPARTMENT :

HR

JOB ROLE :

MANUFACTURING DIRECTOR

RESEARCH DIRECTOR

JOB LEVEL :

Level 5

TRAINING TIME LAST YEAR :

LEVEL 6

YEARS AT COMPANY :

31 TO 40

YEARS WITH CURRENT MANAGER

ENVIRONMENT SATISFACTION

JOB SATISFACTION

EDUCATION FIELD : HR

NO OF COMPANIES WORKED :

4 TO 7 OR MORE THAN 7

ACTUAL WORKING HOURS :

MORE THAN 8 HOURS

AGE

MARITIAL STATUS :

SINGLE

FACTORS **MODERATELY** AFFECTING PEOPLE TO LEAVE THE FIRM

BASED ON THE MODEL DEVELOPED

TOTAL WORKING YEARS :

21 TO 30 OR FRESHER

YEAR SINCE LAST PROMOTION :

11 TO 15 YEARS

STOCK OPTION:

LEVEL 1

JOB INVOLVEMENT

WORK LIFE BALANCE

EDUCATION

SOLUTIONS FOR CONTROLLION ATTRITION

SOLUTION:

Business travel and long work hours need to be checked and appropriate comp-offs need to be given for better work-life balance.

Leave policy need to be revised, especially the HR department

Salary hike at the higher job roles and levels need to be given people who want to stay with the company.

Preference to married employees in promotions and maintaining an organic training schedule.