

# HR Analytics - Employee Attrition Analysis

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## Abstract:

Attrition is basically the turnover rate of employees inside an organization. Employee Attrition can happen due to many reasons such as 1. Employees looking for better opportunities. 2. A negative working environment. 3. Bad Management 4. Sickness of an employee 5. Excessive working hours We have developed a model that helps an organization understand the factors that possibly contribute to employee attrition.

**Keywords** — Employee Attrition, Turnover

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## I. INTRODUCTION

Most email spam messages are commercial in nature. Whether commercial or not, many are not only annoying, but also dangerous because they may contain links that lead to phishing web sites or sites that are hosting malware or include malware as file attachments. Spammers collect email addresses from chat rooms, websites, customers lists, newsgroups, and viruses that harvest users' address books. These collected email addresses are sometimes also sold to other spammers.

## II. LITERATURE REVIEW

### A. HR Analytics: A Literature Review and New Conceptual Model

-H.H.D. Pooja Jayani Opatha

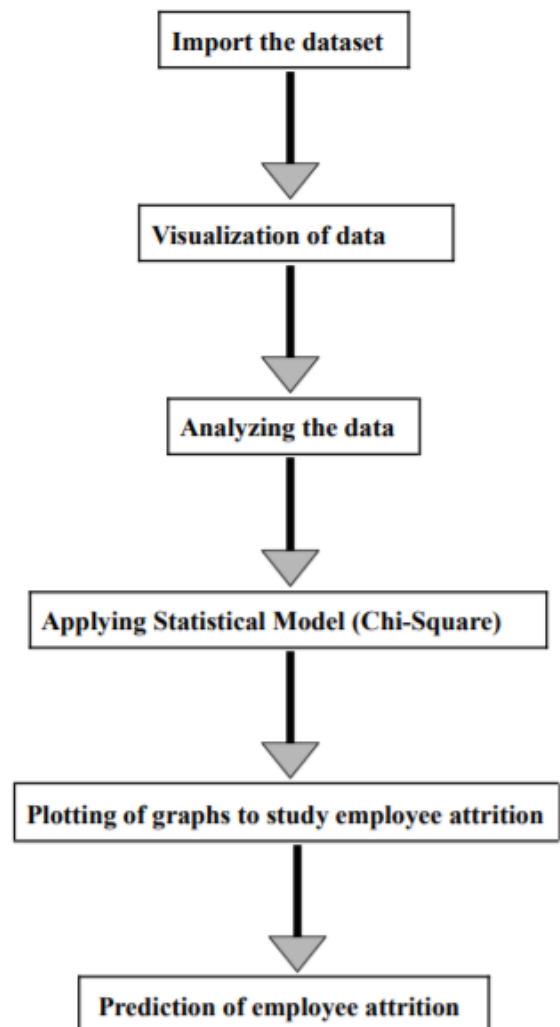
This Author tries to achieve five objectives: 1) what HR analytics means and its importance, 2) what the process of HR analytics is, 3) possible HR questions that can be answered by HR analytics, 4) a new model for HR analytics, and 5) challenges that exist for HR analytics.

### B. Leveraging HR Analytics to Turn Around Fortunes

-Sheela Bhargava

This case study is based on industry insight. The case highlights the role of HR analytics in turning around the fortunes. It captures the narrative of a start-up which was struggling in terms of employee retention. The hotel faced difficulty in maintaining service quality and attracting as well as retaining the customers. The Promoter of the hotel was trying hard to figure out why his employees were leaving the organization despite a competitive compensation package and generous benefits. In each quarter, the attrition rate was about 8-10% which resulted in a loss to the tune of 14.8% and 15.2% in two consecutive years.

## III. METHODOLOGY



## IV. ALGORITHM DETAILS

### A. Chi Square

Chi-Square test is a statistical method to determine if two categorical variables have a significant correlation between them. Both those variables should be from the same population and they should be categorical like – Yes/No, Male/Female, Red/Green etc. For example, we can build a data set with observations on people's ice-cream buying patterns and try to correlate the gender of a person with the flavor of the ice-cream they prefer. If a correlation is found we can plan for appropriate stock of flavors by knowing the number of gender of people visiting.

Syntax - `chisq.test(data)`

Example = `library("DATASET")`

```
print(str(emp))
```

```
# Load the library.
```

```
library("DATASET")
```

```
# Create a data frame from the main data set.  
car.data <- data.frame(employee_satisfaction,  
employee_left)
```

```
# Create a table with the needed variables. car.data  
= table(employee_satisfaction, employee_left)  
print(employee.data)
```

```
# Perform the Chi-Square test.  
print(chisq.test(employee.data))
```

## V. IMPLEMENTATION

### A. Implementation in R (Code of R) :

```
library(ggplot2)
```

```
library(dplyr)
```

```
library(tidyr)
```

```
hrm<-read.csv('E:/documents/BEIT/Sem 8/R  
PRG/Human-Resource-Analytics/Dataset/HR_com  
ma_sep.csv')
```

```
#Structure of the Dataset
```

```
str(hrm)
```

```
attach(hrm)
```

```
#converting left variable to factor variable  
hrm$left<-ifelse(hrm$left==1,'True','False')
```

```
hrm$left<-factor(hrm$left,labels=c("True","False")  
) table(hrm$left) #Summary Statistics of the  
dataset summary(hrm)
```

```
by(hrm$satisfaction_level,hrm$salary,summary)
```

```
p1<-ggplot(aes(x=satisfaction_level),data=hrm) +  
geom_histogram(color="black",fill="red",bins =  
30) + labs(title="Satisfaction level  
Histogram",x='Satisfaction Level of Employees',  
y="Frequency")
```

```
#Boxplot for Satisfaction level vs left ggplot(aes(x  
= left,y=satisfaction_level),data= hrm) +  
geom_boxplot() + ylab('Satisfaction Level') +  
xlab("Employee left") + labs(fill="Salary Classes")  
table(left , salary)
```

```
#Analysis on number of Projects  
hrm$number_project<-factor(hrm$number_project)  
ggplot(aes(x=number_project),data = hrm) +  
geom_bar(color='black',fill='#234338') +  
xlab("Number of Projects") + ylab("Frequency") +  
labs(title="Barplot of Number of projects")
```

```
#faceted by salary
```

```
ggplot(aes(x=number_project),data = hrm) +  
geom_bar(color='black',fill='#834338') +  
xlab("Number of Projects") + ylab("Frequency") +  
labs(title="Barplot of Number of projects faceted  
by Salary") + facet_wrap(~salary)
```

```
#faceted by If a employee left or not
```

```
ggplot(aes(x=number_project),data = hrm) +  
geom_bar(color='black',fill='#547398') +  
xlab("Number of Projects") + ylab("Frequency") +  
labs(title="Barplot of Number of projects faceted  
by Left")+ facet_wrap(~left)
```

```
#Analysis of average monthly hours
```

```
summary(average_montly_hours) #Somewhat  
Normally distributed ggplot(aes(x=  
average_montly_hours),data = hrm)+  
geom_histogram(color='black',fill="yellow",bins =  
30)
```

```
#Analysis for variable Time spend at company
```

```
table(hrm$time_spend_company) ggplot(aes(x =  
factor(time_spend_company)),data = hrm) +  
geom_bar(fill = 'purple',color='black') +  
xlab("Time spend at company in years") +  
ylab("Frequency")+ labs(title = "Barplot of Time  
spend at Company")
```

```
#Analysis of Department of Work ggplot(aes(x
```

```
=sales),data = hrm ) + geom_bar() +  
xlab('Department') + ylab('Counts') + coord_flip()  
#highest count is for Sales department then  
Technical and least for #Management
```

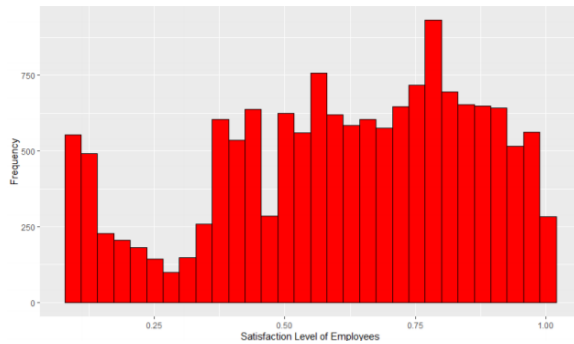
```
#Analysis of Department vs Time spend at
```

```
company by(time_spend_company,sales,summary)  
#Maximum Mean Time spent by Management  
Employees ggplot(aes(x =  
time_spend_company),data = hrm) + geom_bar() +  
xlab("Time Spend at Company splitted by
```

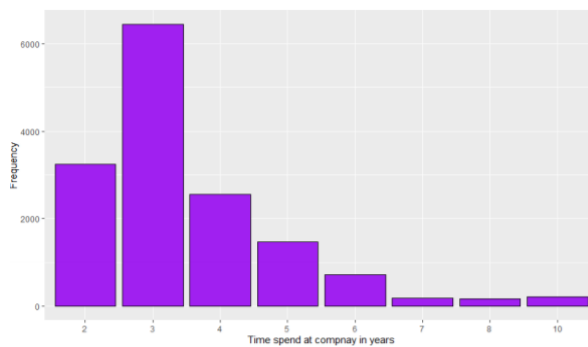
Department") + facet\_wrap(~sales) #In every department there is very less count of Employees # working for over 5 years

## Results

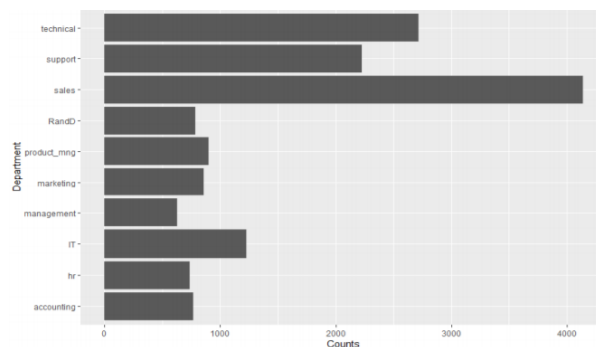
### B. Satisfaction Histogram



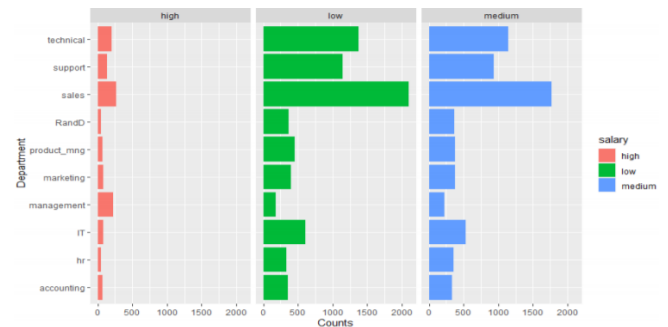
### C. Time Spent at Company



### D. Department wise employee count



### E. Department and their count faceted by salary range



## CONCLUSION

The following conclusions were drawn from the analysis of the data, the employees who had spent 3-5 years in the organizations were most likely to leave the organizations, Those who worked more than 6 years were least likely to leave. The highest median satisfaction was for the R & D and Management department in the organization, employees who worked in HR and Accounting had least satisfaction. The highest promotion in last five years was in the Management department whereas no promotions were given in IT & Product Management departments in last five years

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## REFERENCES

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