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HR Analytics: Employee Attrition Analysis using Power BI, R Studio and SPSS

Mr. A. Prasanth[1] and Vasanth M[2]
Assistant Professor, Department of Management Sciences[1]
II MBA Student, Department of Management Sciences[2]
Hindusthan College of Engineering and Technology, Coimbatore, India

Abstract: *Employee attrition can become a serious issue because of the impacts on the organization's competitive advantage. It can become costly for an organization. The cost of employee attritionwould be the cost related to the human resources life cycle, lost knowledge, employee morale,and organizational culture. This study aimed to analyze employee attrition. The result obtained can be used by the management to understand what modifications they should perform to the workplace to get most of their workers to stay. The data for the study were around one thousandfour Hundred employees. I collect the employee details from the organization and using PowerBI for making visuals with the use of various kind of charts and analyzing the employee attrition using SPSS. The study has six steps: (1) data collection, (2) data pre-processing, (3) data analysis, (4) Making Visuals, (5) Identifying key factors, (6) Generate insights and recommendation, and (7) Analysis using SPSS. Remember that each organization's attrition analysis process may vary based on specific goals, available data, and resources. It's important to tailor the analysis approach to meet the unique needs of your organization.*

Keywords: Employee attrition, Data visualization, Insights and analytics, Descriptive Statistics, Power BI, SPSS (Statistical Packages for the Social Science)

I. INTRODUCTION

The purpose of Human Resource Management is covering worker performance and commitment, analyzing workers collaboration models, investigating employee chum and turnover, and creating employee lifetime estimation. Human resource analytics is a developingapplication area of analytics of HRM objectives [1]. On the other hand, the reputation of HR Analytics restricted in a high-quality scientific evidence-based study [2]. The employee is oneof the most critical assets in today's knowledge-driven industry. Employee attrition can becomea serious issue because of the impacts on the organization's competitive advantage. Employeeattrition can become costly for an organization. The cost of employee attrition would be the cost related to the human resources life cycle, lost knowledge, employee morale, and organizational culture

Welcome to the HR Attrition Dashboard! This powerful tool provides comprehensive insights into employee attrition within our organization. Understanding and managing attrition is crucial for maintaining a stable workforce, retaining top talent, and ensuring the organization's long-term success. The HR Attrition Dashboard consolidates data, analytics, and visualizations to provide HR professionals, managers, and leaders with valuable information on attrition trends, contributing factors, and potential retention strategies.

With this dashboard, you can explore key attrition metrics, analyze demographic patterns, identify reasons behind employee departures, and gain actionable insights to improve retention efforts. By leveraging the power of data-driven decision-making, we can proactively address attrition challenges, enhance employee satisfaction, and foster a positive work environment.

The HR Attrition Dashboard is designed to provide a holistic view of attrition throughout the organization. It offers a user-friendly interface that allows you to navigate through various sections and interact with dynamic visualizations. Whether you are an HR professional responsible for talent management or a manager seeking to better understand attrition within your team, this dashboard provides the necessary tools and information to make informed decisions.

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SPSS (Statistical Package for the Social Sciences) is a widely used statistical software tool that provides a range of features for data analysis, including descriptive statistics, inferential statistics, data visualization, and predictive modeling. It offers a user-friendly interface and powerful analytical capabilities, making it an ideal tool for conducting employee attrition analysis.

II. EMPLOYEE ATTRITION IN ORGANIZATION

Employee attrition in an organization refers to the rate at which employees leave or voluntarily separate from the company over a specified period of time. It is a significant concern for organizations as it can have various impacts on their operations, productivity, and overall success

Addressing employee attrition requires organizations to focus on employee engagement, talent management, providing competitive compensation and benefits, fostering a positive work environment, recognizing employee contributions, offering growth opportunities, and addressing any underlying issues affecting job satisfaction and work-life balance.

By implementing effective retention strategies and regularly monitoring attrition rates, organizations can proactively manage employee attrition, improve employee satisfaction and retention, and maintain a stable and productive workforce.

III. OBJECTIVES

- To identify Patterns and Trends
- To explore factors Contributing to Attrition
- To gain Insights for Talent Management
- To visualize attrition data
- To support HR strategy development
- To monitor and benchmark attrition

IV. METHODS

4.1 Experiment Tool

I collect the employee details from the organization and using Power BI for making visuals with the use of various kind of charts for analyzing the employee attrition using SPSS.

4.2 Attrition analysis steps

The analysis process is divided into five steps as follows:

- **Data Collection**: collecting and analyzing the data to grasp better what should be the main goals of the study.
- **Data Pre-processing:** pre-process the data to suit them with the analysis method. The pre-processing may involve cleaning up the data, transforming the data, or creating new variables that may bring useful information for the analysis steps.
- **Data Analysis:** this step creates textual and visual summaries of the dataset that highlight some characteristics of the data.
- **Making Visuals:** Making visuals in Power BI with the different kinds of charts, from converting raw data into useful dashboards
- **Identifying key factors:** Identify the key factors that contribute to attrition within your organization. This can be done data visualization to identify important predictors of attrition.
- **Generate insights and recommendation:** Summarize the findings from your analysis and generate actionable insights. Identify trends, patterns, and potential solutions to address attrition. Develop recommendations for HR strategies and initiatives to improve retention and reduce attrition rates.
- **Analysis using SPSS:** The analysis in SPSS may involve descriptive statistics to summarize and explore the data, inferential statistics to test hypotheses and identify significant relationships

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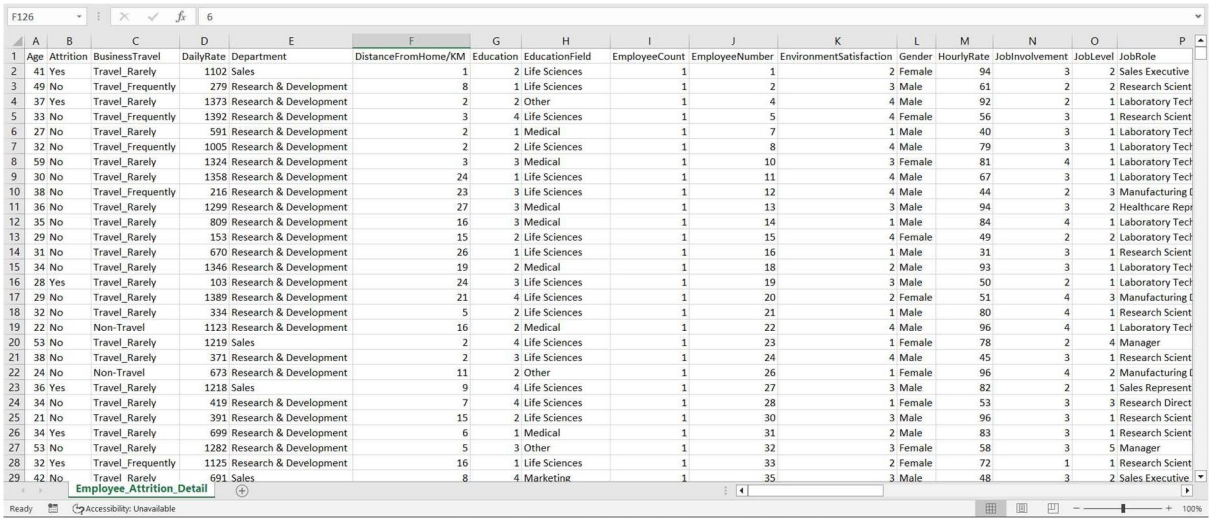
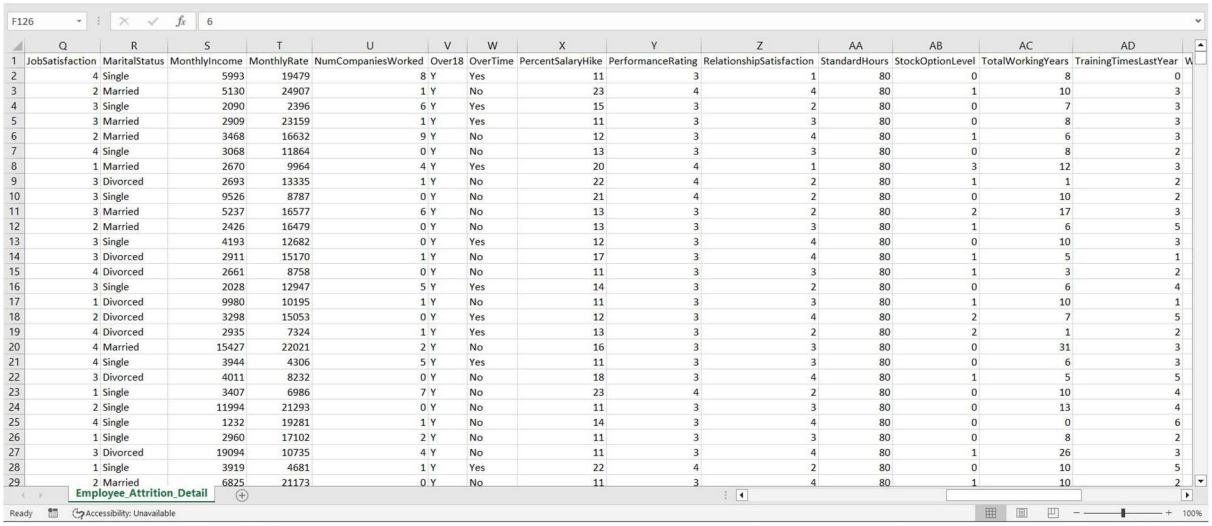
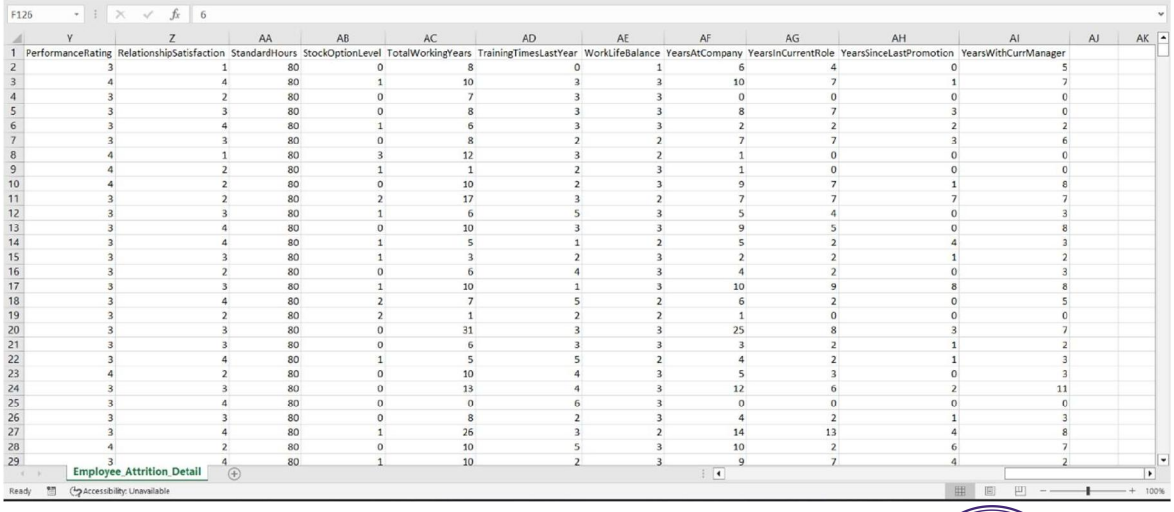
V. DATASET



Age	Attrition	BusinessTravel	DailyRate	Department	DistanceFromHome/KM	Education	EducationField	EmployeeCount	EmployeeNumber	EnvironmentSatisfaction	Gender	HourlyRate	JobInvolvement	JobLevel	JobRole
41	Yes	Travel_Rarely	1102	Sales	1	2	Life Sciences	1	1	2	Female	94	3	2	Sales Executive
49	No	Travel_Frequently	279	Research & Development	8	1	Life Sciences	1	2	3	Male	61	2	2	Research Scient
37	Yes	Travel_Rarely	1373	Research & Development	2	2	Other	1	4	4	Male	92	2	1	Laboratory Tech
33	No	Travel_Frequently	1392	Research & Development	3	4	Life Sciences	1	5	4	Female	56	3	1	Research Scient
27	No	Travel_Rarely	591	Research & Development	2	1	Medical	1	7	1	Male	40	3	1	Laboratory Tech
32	No	Travel_Frequently	1005	Research & Development	2	2	Life Sciences	1	8	4	Male	79	3	1	Laboratory Tech
59	No	Travel_Rarely	1324	Research & Development	3	3	Medical	1	10	3	Female	81	4	1	Laboratory Tech
30	No	Travel_Rarely	1358	Research & Development	24	1	Life Sciences	1	11	4	Male	67	3	1	Laboratory Tech
38	No	Travel_Frequently	216	Research & Development	23	3	Life Sciences	1	12	4	Male	44	2	3	Manufacturing D
36	No	Travel_Rarely	1299	Research & Development	27	3	Medical	1	13	3	Male	94	3	2	Healthcare Repr
35	No	Travel_Rarely	809	Research & Development	16	3	Medical	1	14	1	Male	84	4	1	Laboratory Tech
29	No	Travel_Rarely	153	Research & Development	15	2	Life Sciences	1	15	4	Female	49	2	2	Laboratory Tech
31	No	Travel_Rarely	670	Research & Development	26	1	Life Sciences	1	16	1	Male	31	3	1	Research Scient
34	No	Travel_Rarely	1346	Research & Development	19	2	Medical	1	18	2	Male	93	3	1	Laboratory Tech
28	Yes	Travel_Rarely	103	Research & Development	24	3	Life Sciences	1	19	3	Male	50	2	1	Laboratory Tech
29	No	Travel_Rarely	1389	Research & Development	21	4	Life Sciences	1	20	2	Female	51	4	3	Manufacturing D
32	No	Travel_Rarely	334	Research & Development	5	2	Life Sciences	1	21	1	Male	80	4	1	Research Scient
22	No	Non-Travel	1123	Research & Development	16	2	Medical	1	22	4	Male	96	4	1	Laboratory Tech
53	No	Travel_Rarely	1219	Sales	2	4	Life Sciences	1	23	1	Female	78	2	4	Manager
38	No	Travel_Rarely	371	Research & Development	2	3	Life Sciences	1	24	4	Male	45	3	1	Research Scient
24	No	Non-Travel	673	Research & Development	11	2	Other	1	26	1	Female	96	4	2	Manufacturing D
36	Yes	Travel_Rarely	1218	Sales	9	4	Life Sciences	1	27	3	Male	82	2	1	Sales Represent
34	No	Travel_Rarely	419	Research & Development	7	4	Life Sciences	1	28	1	Female	53	3	3	Research Direct
21	No	Travel_Rarely	391	Research & Development	15	2	Life Sciences	1	30	3	Male	96	3	1	Research Scient
34	Yes	Travel_Rarely	699	Research & Development	6	1	Medical	1	31	2	Male	83	3	1	Research Scient
53	No	Travel_Rarely	1282	Research & Development	5	3	Other	1	32	3	Female	58	3	5	Manager
32	Yes	Travel_Frequently	1125	Research & Development	16	1	Life Sciences	1	33	2	Female	72	1	1	Research Scient
42	No	Travel_Rarely	691	Sales	8	4	Marketing	1	35	3	Male	48	3	2	Sales Executive



JobSatisfaction	MaritalStatus	MonthlyIncome	MonthlyRate	NumCompaniesWorked	Over18	OverTime	PercentSalaryHike	PerformanceRating	RelationshipSatisfaction	StandardHours	StockOptionLevel	TotalWorkingYears	TrainingTimesLastYear
4	Single	5993	19479	8	Y	Yes	11	3	1	80	0	8	0
2	Married	5130	24907	1	Y	No	23	4	4	80	1	10	3
3	Single	2090	2396	6	Y	Yes	15	3	2	80	0	7	3
3	Married	2909	23159	1	Y	Yes	11	3	3	80	0	8	3
2	Married	3468	16632	9	Y	No	12	3	4	80	1	6	3
4	Single	3068	11864	0	Y	No	13	3	3	80	0	8	2
1	Married	2670	9964	4	Y	Yes	20	4	1	80	3	12	3
3	Divorced	2693	13335	1	Y	No	22	4	2	80	1	1	2
3	Single	9526	8787	0	Y	No	21	4	2	80	0	10	2
3	Married	5237	16577	6	Y	No	13	3	2	80	2	17	3
2	Married	2426	16479	0	Y	No	13	3	3	80	1	6	5
3	Single	4193	12682	0	Y	Yes	12	3	4	80	0	10	3
3	Divorced	2911	15170	1	Y	No	17	3	4	80	1	5	1
4	Divorced	2661	8758	0	Y	No	11	3	3	80	1	3	2
3	Single	2028	12947	5	Y	Yes	14	3	2	80	0	6	4
1	Divorced	9980	10195	1	Y	No	11	3	3	80	1	10	1
2	Divorced	3298	15053	0	Y	Yes	12	3	4	80	2	7	5
4	Divorced	2935	7324	1	Y	Yes	13	3	2	80	2	1	2
4	Married	15427	22021	2	Y	No	16	3	3	80	0	31	3
4	Single	3944	4306	5	Y	Yes	11	3	3	80	0	6	3
3	Divorced	4011	8232	0	Y	No	18	3	4	80	1	5	5
1	Single	3407	6986	7	Y	No	23	4	2	80	0	10	4
2	Single	11994	21293	0	Y	No	11	3	3	80	0	13	4
4	Single	1232	19281	1	Y	No	14	3	4	80	0	0	6
1	Single	2960	17102	2	Y	No	11	3	3	80	0	8	2
3	Divorced	19094	10735	4	Y	No	11	3	4	80	1	26	3
1	Single	3919	4681	1	Y	Yes	22	4	2	80	0	10	5
2	Married	6825	21173	0	Y	No	11	3	4	80	1	10	2



PerformanceRating	RelationshipSatisfaction	StandardHours	StockOptionLevel	TotalWorkingYears	TrainingTimesLastYear	WorkLifeBalance	YearsAtCompany	YearsInCurrentRole	YearsSinceLastPromotion	YearsWithCurrManager
3	1	80	0	8	0	1	6	4	0	5
4	4	80	1	10	3	3	10	7	1	7
3	2	80	0	7	3	3	0	0	0	0
3	3	80	0	8	3	3	8	7	3	0
3	4	80	1	6	3	3	2	2	2	2
3	3	80	0	8	2	2	7	7	3	6
4	1	80	3	12	3	2	1	0	0	0
4	2	80	1	1	2	3	1	0	0	0
4	2	80	0	10	2	3	9	7	1	8
3	2	80	2	17	3	2	7	7	7	7
3	3	80	1	6	5	3	5	4	0	3
3	4	80	0	10	3	3	9	5	0	8
3	4	80	1	5	1	2	5	2	4	3
3	3	80	1	3	2	3	2	2	1	2
3	2	80	0	6	4	3	4	2	0	3
3	3	80	1	10	1	3	10	9	8	8
3	4	80	2	7	5	2	6	2	0	5
3	2	80	2	1	2	2	1	0	0	0
3	3	80	0	31	3	3	25	8	3	7
3	3	80	0	6	3	3	3	2	1	2
3	4	80	1	5	5	2	4	2	1	3
4	2	80	0	10	4	3	5	3	0	3
3	3	80	0	13	4	3	12	6	2	11
3	4	80	0	0	6	3	0	0	0	0
3	3	80	0	8	2	3	4	2	1	3
3	4	80	1	26	3	2	14	13	4	8
4	2	80	0	10	5	3	10	2	6	7
3	4	80	1	10	2	3	9	7	4	2

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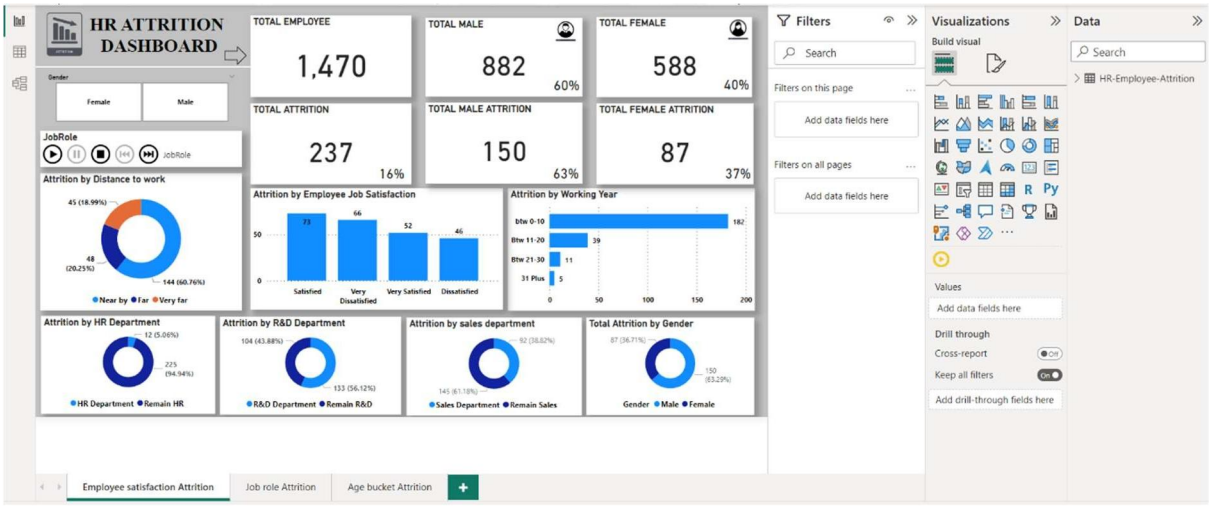
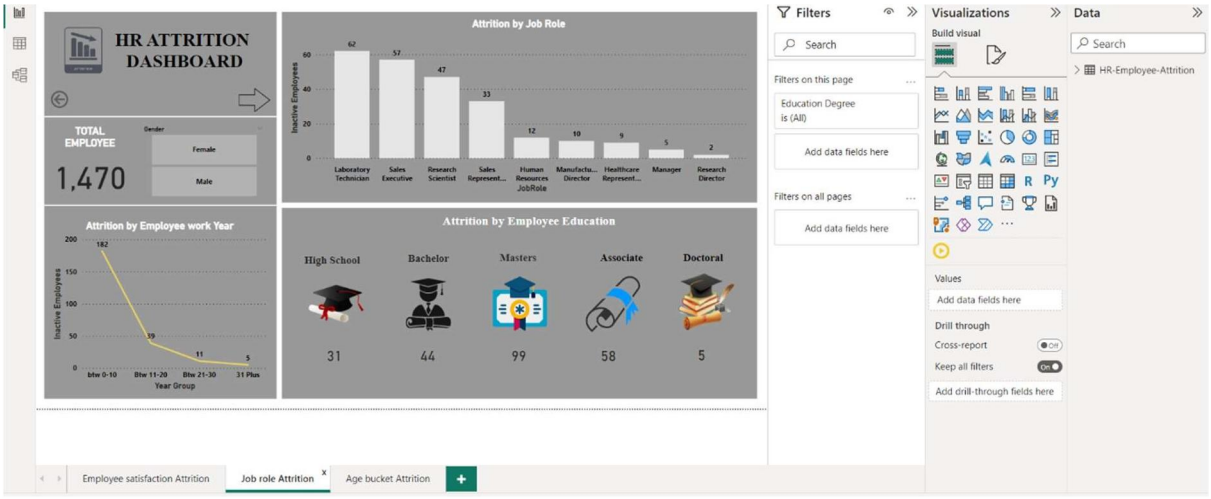
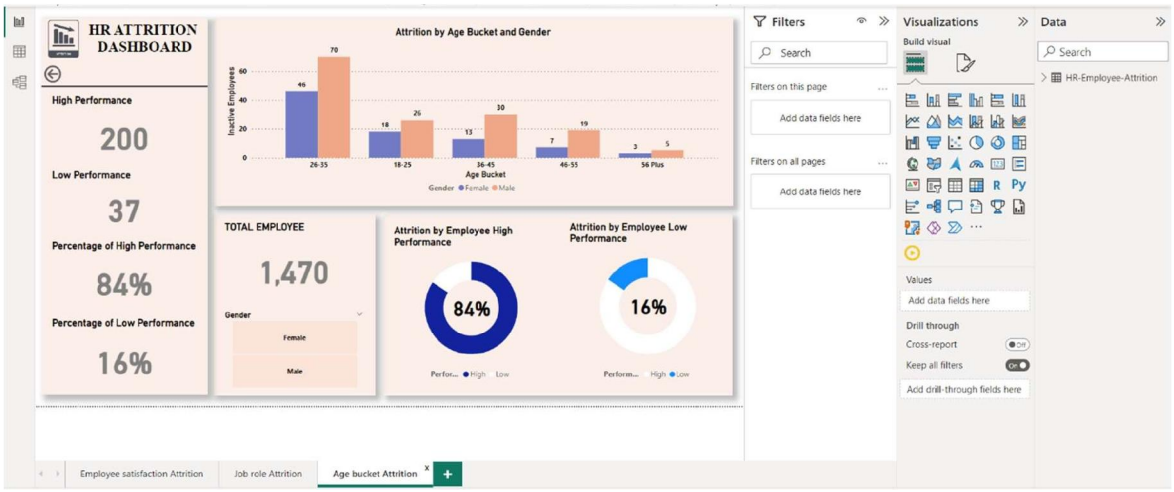
VI. DASHBOARD VISUALS







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VII. DAX FUNCTION USED

```
Total Employee = COUNTROWS('HR-Employee-Attrition')
MALE = CALCULATE([Total Employee],'HR-Employee-Attrition'[Gender]="male") FEMALE = CALCULATE([Total Employee],'HR-Employee-Attrition'[Gender]="female")
% MALE = DIVIDE([MALE],[Total Employee],0)
% FEMALE = DIVIDE([FEMALE],[Total Employee],0)
Total Attrition = CALCULATE ([Total Employee],FILTER('HR-Employee-Attrition','HR- Employee-Attrition'[Attrition]="Yes"))
% Attrition = DIVIDE ([Total Attrition], [Total Employee],0)
Male Attrition = CALCULATE([Total Attrition],FILTER('HR-Employee-Attrition','HR- Employee-Attrition'[Gender]="Male"))
Female Attrition = CALCULATE([Total Attrition],FILTER('HR-Employee-Attrition','HR- Employee-Attrition'[Gender]="Female"))
% MALE ATTRITION = DIVIDE([Male Attrition],[Total Attrition],0)
% FEMALE ATTRITION = DIVIDE([Female Attrition],[Total Attrition],0)
% High Performance = DIVIDE([High Performance],[Total Attrition],0)
% Low Performance = DIVIDE([Low Performance],[Total Attrition],0)
Inactive Employees = CALCULATE([Total Employee],FILTER('HR-Employee-Attrition','HR- Employee-Attrition'[Attrition]="Yes"))
HR Department = CALCULATE('HR-Employee-Attrition'[Total Attrition],FILTER('HR- Employee-Attrition','HR-Employee-Attrition'[Department] = "Human resources"))
R&D Department = CALCULATE('HR-Employee-Attrition'[Total Attrition],FILTER('HR- Employee-Attrition','HR-Employee-Attrition'[Department] = "Research & Development"))
Sales Department = CALCULATE('HR-Employee-Attrition'[Total Attrition],FILTER('HR- Employee-Attrition','HR-Employee-Attrition'[Department] = "sales"))
Remain HR = [Total Attrition] - [HR Department] Remain R&D = [Total Attrition] - [R&D Department] Remain Sales = [Total Attrition] - [Sales Department]
High Performance = CALCULATE([Inactive Employees],FILTER('HR-Employee- Attrition','HR-Employee-Attrition'[Performance Status] ="High"))
Low Performance = CALCULATE([Inactive Employees],FILTER('HR-Employee- Attrition','HR-Employee-Attrition'[Performance Status]="Low"))
```

VIII. R STUDIO

```
View(HR.Data)
names(HR.Data)
colnames(HR.Data)[1] <- "Age"
> library(dplyr)
glimpse(HR.Data)
summary(HR.Data)
cat("Thus Data Set has ",dim(HR.data)[1], " Rows and ", dim(HR.data)[2], " Columns" )
apply(is.na(HR.data), 2, sum)
HR.data$EmployeeNumber<- NULL
HR.data$StandardHours <- NULL
HR.data$Over18 <- NULL
HR.data$EmployeeCount <- NULL
cat("Data Set has ",dim(HR.data)[1], " Rows and ", dim(HR.data)[2], " Columns" )
sum(is.na(duplicated(HR.data)))
HR.data$Education <- factor(HR.data$Education)
HR.data$EnvironmentSatisfaction <- factor(HR.data$EnvironmentSatisfaction)
```

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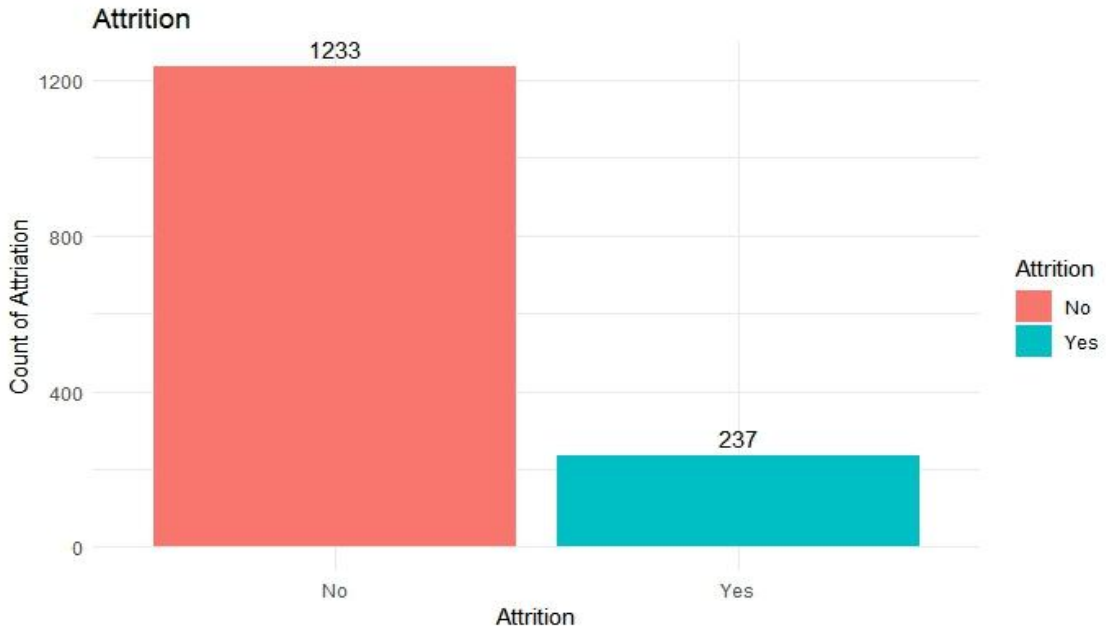
```
HR.data$JobInvolvement <- factor(HR.data$JobInvolvement)
HR.data$JobLevel <- factor(HR.data$JobLevel)
HR.data$JobSatisfaction <- factor(HR.data$JobSatisfaction)
HR.data$PerformanceRating <- factor(HR.data$PerformanceRating)
HR.data$RelationshipSatisfaction <- factor(HR.data$RelationshipSatisfaction)
HR.data$StockOptionLevel <- factor(HR.data$StockOptionLevel)
HR.data$WorkLifeBalance <- factor(HR.data$WorkLifeBalance)
library(ggplot2)
HR.data %>%
    group_by(Attrition) %>%
    tally() %>%
    ggplot(aes(x = Attrition, y = n,fill=Attrition)) +
    geom_bar(stat = "identity") +
    theme_minimal()+
    labs(x="Attrition", y="Count of Attriation")+
    ggtitle("Attrition")+
    geom_text(aes(label = n), vjust = -0.5, position = position_dodge(0.9))
```




```
prop.table(table(HR.data$Attrition))
library(ggplot2)
ggplot(data=HR.data, aes(HR.data$Age)) +
    geom_histogram(breaks=seq(20, 50, by=2),
                   col="Yellow",
                   aes(fill=..count..))+
    labs(x="Age", y="Count")


 scale_fill_gradient("Count", low="red", high="Black")
```

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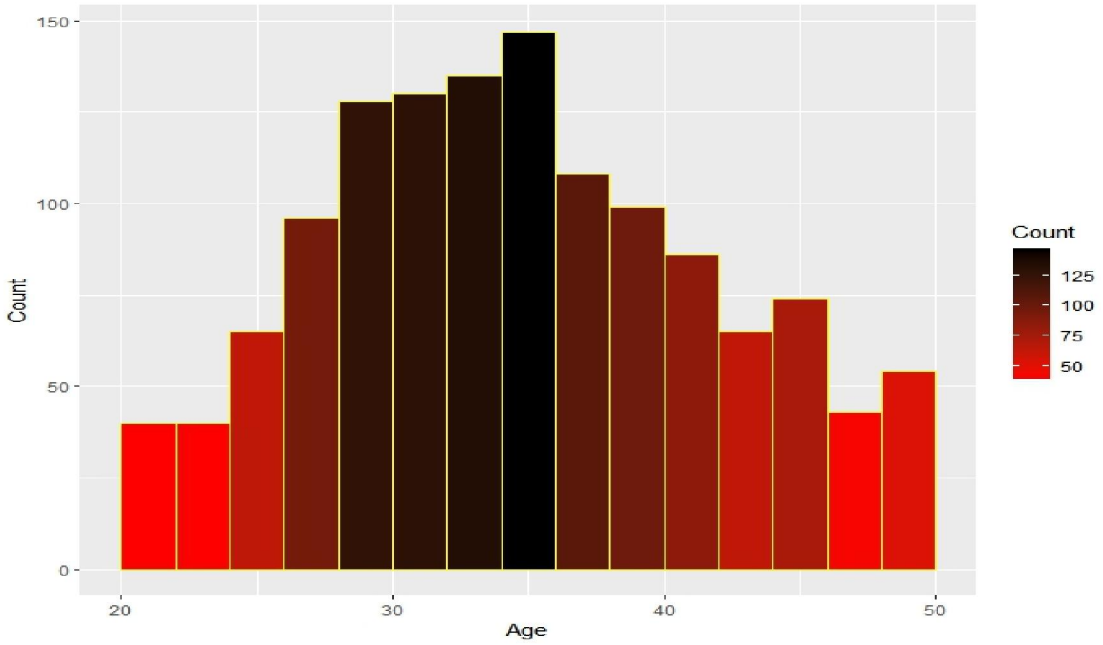


```
library(grid)
library(gridExtra)
travelPlot <- ggplot(HR.data,aes(BusinessTravel,fill=Attrition))+geom_bar()
depPlot <- ggplot(HR.data,aes(Department,fill = Attrition))+geom_bar()
distPlot <- ggplot(HR.data,aes(DistanceFromHome,fill=Attrition))+geom_bar()
grid.arrange(travelPlot,depPlot,distPlot, nrow=3)
```


```
eduPlot <- ggplot(HR.data,aes(Education,fill=Attrition))+geom_bar()
```

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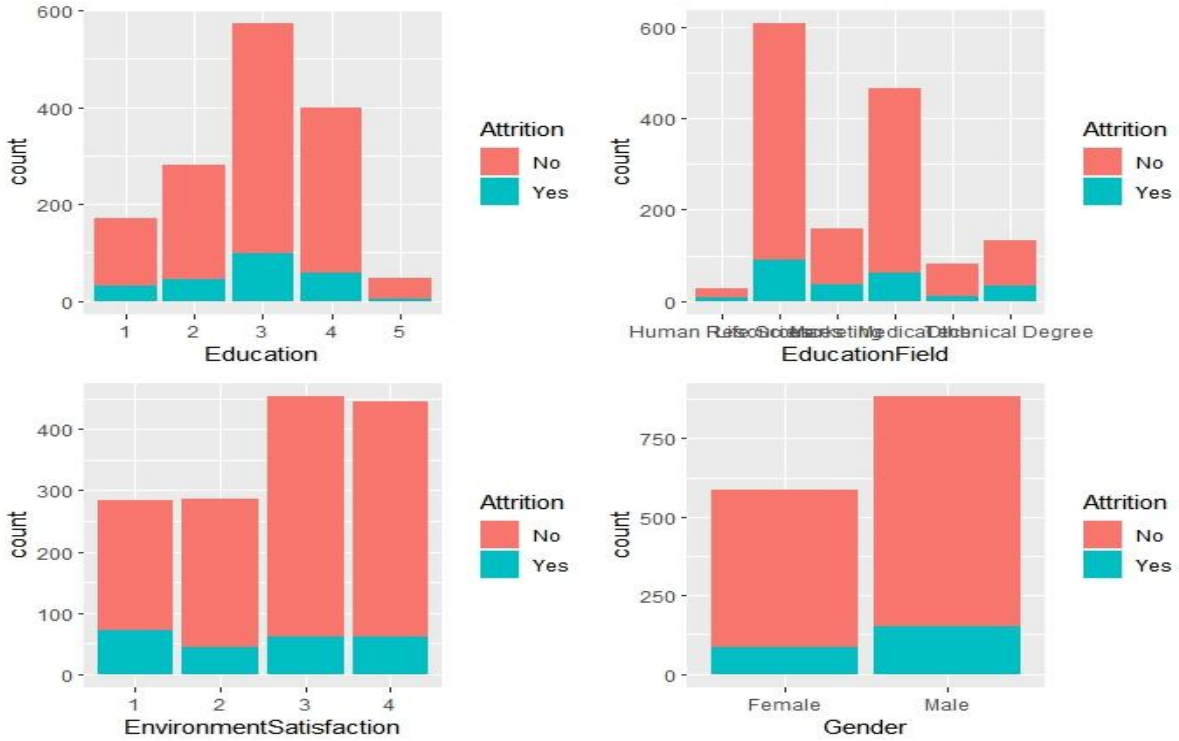
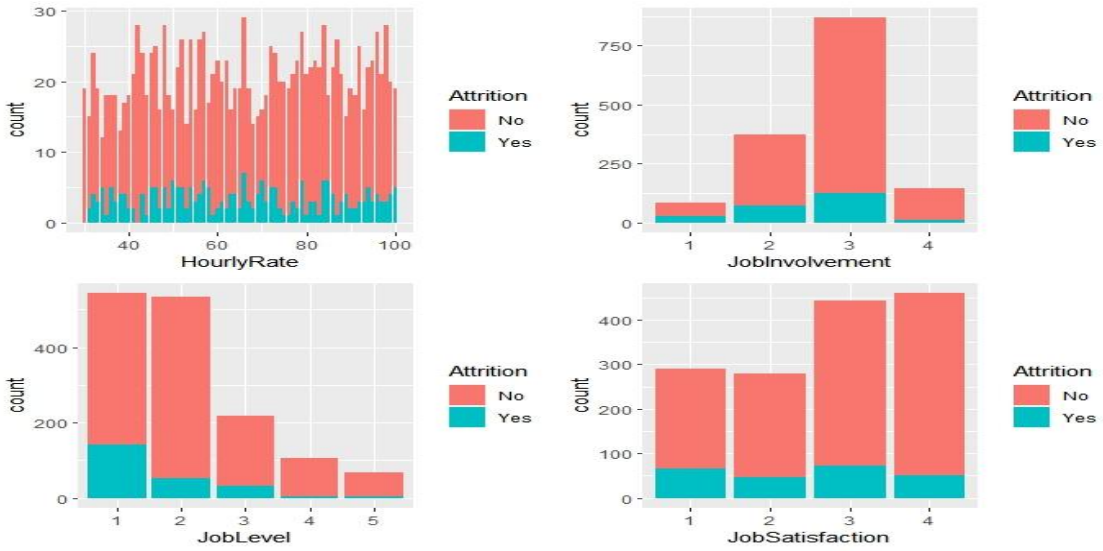
```
edufieldPlot <- ggplot(HR.data,aes(EducationField,fill=Attrition))+geom_bar()
envPlot <- ggplot(HR.data,aes(EnvironmentSatisfaction,fill=Attrition))+geom_bar()
genPlot <- ggplot(HR.data,aes(Gender,fill=Attrition))+geom_bar()
grid.arrange(distPlot,eduPlot,edufieldPlot,envPlot,genPlot,ncol=2)
```




```
hourlyPlot <- ggplot(HR.data,aes(HourlyRate,fill=Attrition))+geom_bar()
jobInvPlot <- ggplot(HR.data,aes(JobInvolvement,fill=Attrition))+geom_bar()
jobLevelPlot <- ggplot(HR.data,aes(JobLevel,fill=Attrition))+geom_bar()
jobSatPlot <- ggplot(HR.data,aes(JobSatisfaction,fill=Attrition))+geom_bar()
grid.arrange(hourlyPlot,jobInvPlot,jobLevelPlot,jobSatPlot,ncol=2)
```




```
marPlot <- ggplot(HR.data,aes(MaritalStatus,fill=Attrition))+geom_bar()
```

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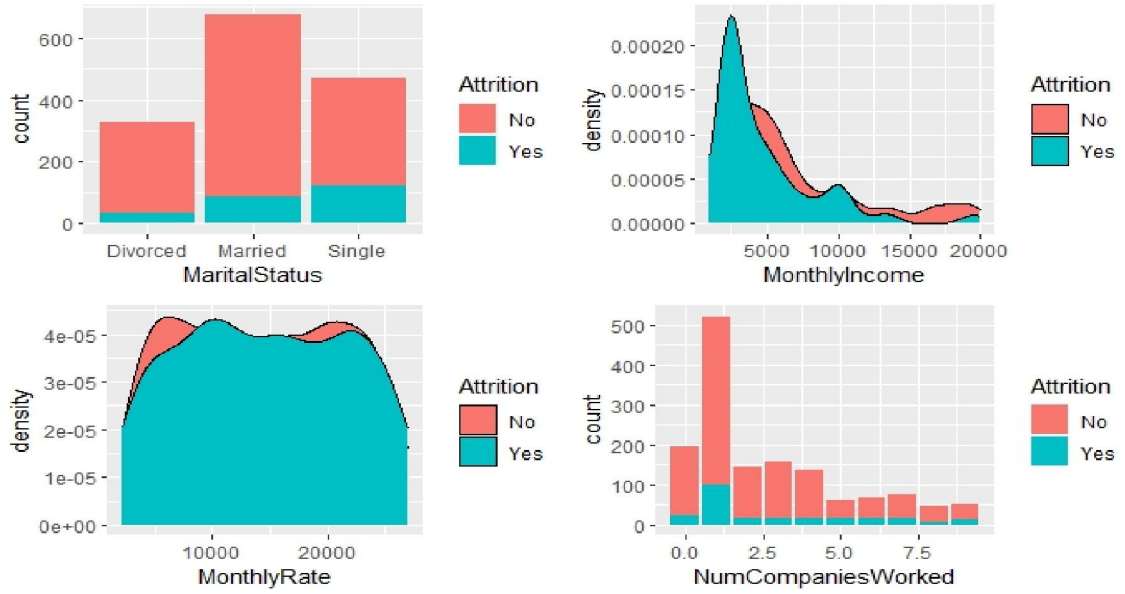
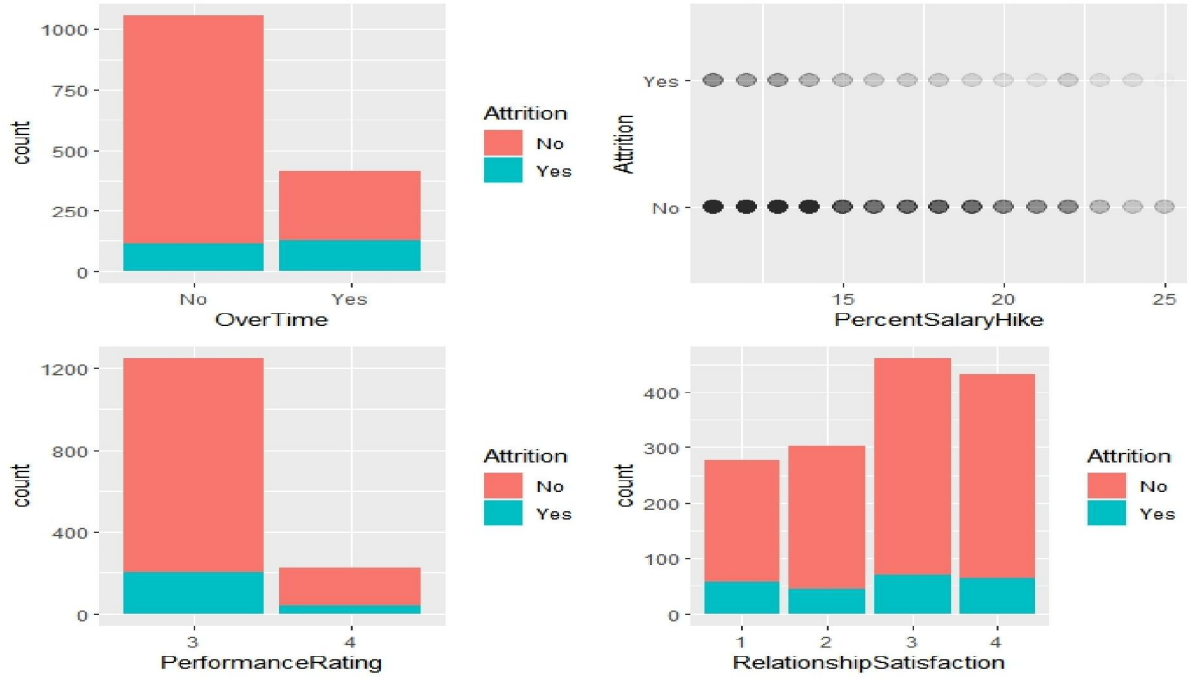
```
monthlyIncPlot <- ggplot(HR.data,aes(MonthlyIncome,fill=Attrition))+geom_density()
monthlyRatePlot <- ggplot(HR.data,aes(MonthlyRate,fill=Attrition))+geom_density()
numCompPlot <- ggplot(HR.data,aes(NumCompaniesWorked,fill=Attrition))+geom_bar()
grid.arrange(marPlot,monthlyIncPlot,monthlyRatePlot,numCompPlot,ncol=2)
```




```
overTimePlot <- ggplot(HR.data,aes(OverTime,fill=Attrition))+geom_bar()
hikePlot <- ggplot(HR.data,aes(PercentSalaryHike,Attrition))+geom_point(size=4,alpha = 0.01)
perfPlot <- ggplot(HR.data,aes(PerformanceRating,fill = Attrition))+geom_bar()
RelSatPlot <- ggplot(HR.data,aes(RelationshipSatisfaction,fill = Attrition))+geom_bar()
grid.arrange(overTimePlot,hikePlot,perfPlot,RelSatPlot,ncol=2)
```




```
StockPlot <- ggplot(HR.data,aes(StockOptionLevel,fill = Attrition))+geom_bar()
workingYearsPlot <- ggplot(HR.data,aes(TotalWorkingYears,fill = Attrition))+geom_bar()
TrainTimesPlot <- ggplot(HR.data,aes(TrainingTimesLastYear,fill = Attrition))+geom_bar()
```

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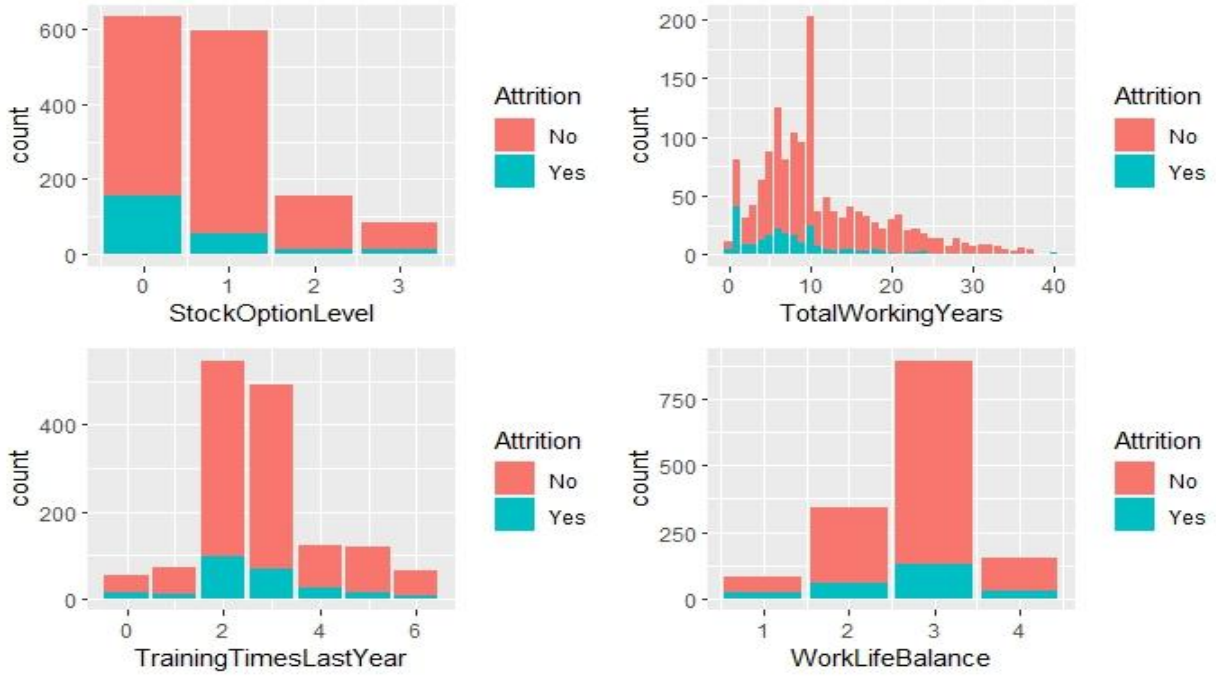
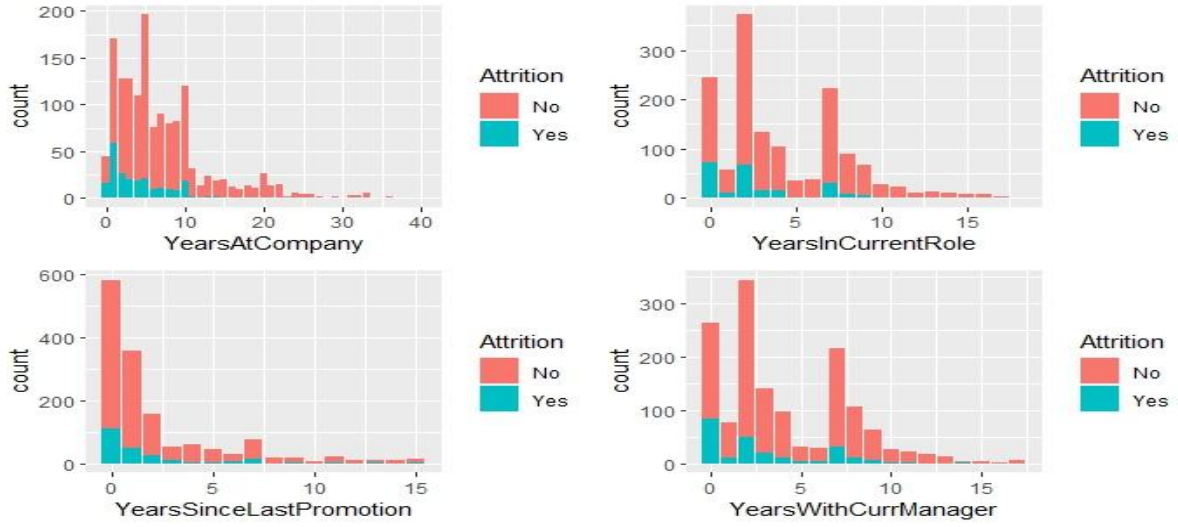
```
WLBPlot <- ggplot(HR.data,aes(WorkLifeBalance,fill = Attrition))+geom_bar()
grid.arrange(StockPlot,workingYearsPlot,TrainTimesPlot,WLBPlot,ncol=2)
```




```
YearAtComPlot <- ggplot(HR.data,aes(YearsAtCompany,fill = Attrition))+geom_bar()
YearInCurrPlot <- ggplot(HR.data,aes(YearsInCurrentRole,fill = Attrition))+geom_bar()
YearsSinceProm <- ggplot(HR.data,aes(YearsSinceLastPromotion,fill = Attrition))+geom_bar()
YearsCurrManPlot <- ggplot(HR.data,aes(YearsWithCurrManager,fill = Attrition))+geom_bar()
grid.arrange(YearAtComPlot,YearInCurrPlot,YearsSinceProm,YearsCurrManPlot,ncol=2,top = "Fig 7")
```



IX. DATA ANALYSIS AND INTERPRETATION IN SPSS

9.1 Frequency test:

The frequency test is a descriptive analysis technique used to examine the distribution of a categorical variable. It provides information about the number and percentage of cases fallinginto each category or level of the variable.

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Attrition					
		Frequency	Percent	Valid Percent	CumulativePercent
Valid	No	1233	83.9	83.9	83.9
	Yes	237	16.1	16.1	100.0
	Total	1470	100.0	100.0	

Interpretation:
The above table shows the percentage of attrition based on the employee's response (yes or no). Based on this, 16% of employees leave their company, and 84% of employees are still working for it.

Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	588	40.0	40.0	40.0
	Male	882	60.0	60.0	100.0
	Total	1470	100.0	100.0	

Interpretation:
The table above displays the total number of employees in their organisation by gender (Maleand Female).

Department					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Human Resources	63	4.3	4.3	4.3
	Research & Development	961	65.4	65.4	69.7
	Sales	446	30.3	30.3	100.0
	Total	1470	100.0	100.0	

Interpretation:
The percentage and total number of employees in each department are shown in the tableabove.

Environment Satisfaction					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	284	19.3	19.3	19.3
	2	287	19.5	19.5	38.8
	3	453	30.8	30.8	69.7
	4	446	30.3	30.3	100.0
	Total	1470	100.0	100.0	

Job Satisfaction					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	289	19.7	19.7	19.7
	2	280	19.0	19.0	38.7
	3	442	30.1	30.1	68.8
	4	459	31.2	31.2	100.0
	Total	1470	100.0	100.0	

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Work Life Balance					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	80	5.4	5.4	5.4
	2	344	23.4	23.4	28.8
	3	893	60.7	60.7	89.6
	4	153	10.4	10.4	100.0
	Total	1470	100.0	100.0	

Interpretation:
The three tables above display percentages and the number of employees who made decisions based on the level of satisfaction

9.2 Descriptive Statistics

Descriptive statistics is a statistical analysis process that focuses on management, presentation, and classification which aims to describe the condition of the data.

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Age	1470	18	60	36.92	9.135
Distance From Home	1470	1	29	9.19	8.107
Environment Satisfaction	1470	1	4	2.72	1.093
Job Involvement	1470	1	4	2.73	.712
Job Satisfaction	1470	1	4	2.73	1.103
Performance Rating	1470	3	4	3.15	.361
Relationship Satisfaction	1470	1	4	2.71	1.081
Work Life Balance	1470	1	4	2.76	.706
Valid N (listwise)	1470				

Interpretation:
The standard deviation, mean, maximum, and minimum values for the variables chosen fromthe dataset are shown in the table above

9.3 Spearman's rank - order Correlation:

The Spearman rank-order correlation coefficient (Spearman's correlation) is a nonparametric measure of the strength and direction of association that exists between two variables measuredon at least an ordinal scale.

Correlations									
		Age	Distance From Home	Environment Satisfaction	Job Involvement	Job Satisfaction	Performance Rating	Relationship Satisfaction	Work Life Balance
Age	Correlation Coefficient	1.000	-.019	.010	.034	-.005	.000	.046	-.004
	Sig. (2-tailed)	.	.460	.707	.187	.843	.997	.077	.887
	N	1470	1470	1470	1470	1470	1470	1470	1470

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Distance From Home	Correlation Coefficient	-.019	1.000	-.010	.034	-.013	.011	.006	-.020
	Sig. (2-tailed)	.460	.	.690	.187	.616	.665	.823	.434
	N	1470	1470	1470	1470	1470	1470	1470	1470
Environment Satisfaction	Correlation Coefficient	.010	-.010	1.000	-.015	-.003	-.029	.005	.027
	Sig. (2-tailed)	.707	.690	.	.558	.909	.264	.838	.298
	N	1470	1470	1470	1470	1470	1470	1470	1470
Job Involvement	Correlation Coefficient	.034	.034	-.015	1.000	-.012	-.025	.038	-.020
	Sig. (2-tailed)	.187	.187	.558	.	.642	.343	.147	.446
	N	1470	1470	1470	1470	1470	1470	1470	1470
Job Satisfaction	Correlation Coefficient	-.005	-.013	-.003	-.012	1.000	.007	-.015	-.030
	Sig. (2-tailed)	.843	.616	.909	.642	.	.789	.574	.254
	N	1470	1470	1470	1470	1470	1470	1470	1470
Performance Rating	Correlation Coefficient	.000	.011	-.029	-.025	.007	1.000	-.033	.007
	Sig. (2-tailed)	.997	.665	.264	.343	.789	.	.206	.794
	N	1470	1470	1470	1470	1470	1470	1470	1470
Relationship Satisfaction	Correlation Coefficient	.046	.006	.005	.038	-.015	-.033	1.000	.018
	Sig. (2-tailed)	.077	.823	.838	.147	.574	.206	.	.498
	N	1470	1470	1470	1470	1470	1470	1470	1470
Work Life Balance	Correlation Coefficient	-.004	-.020	.027	-.020	-.030	.007	.018	1.000
	Sig. (2-tailed)	.887	.434	.298	.446	.254	.794	.498	.
	N	1470	1470	1470	1470	1470	1470	1470	1470

Interpretation:
The correlation coefficient and significance value of the selected variable from the given dataset are shown in the table above.

X. CONCLUSION

After conducting an employee attrition analysis using SPSS and Power BI, several conclusions can be drawn. These conclusions are based on the insights and patterns identified during the analysis. The analysis reveals the overall attrition rate within the organization. This information provides a baseline understanding of the frequency at which employees are leaving the company. Through statistical analysis and data exploration, it is possible to identify the key factors driving attrition. These factors may include job satisfaction, salary, work-life balance, career development opportunities, or interpersonal relationships. Understanding these drivers can help organizations take proactive measures to reduce attrition by addressing specific areas of concern. By linking data from employee engagement surveys or performance evaluations, it becomes possible to assess the relationship between engagement levels and attrition rates. Lower engagement levels may indicate a higher likelihood of attrition. This insight highlights the importance of fostering a positive work environment and employee satisfaction

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