HR Attrition

ANALYSIS

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01

INTRODUCTION & DATA OVERVIEW

INTRODUCTION

- **This HR Attrition data analysis project focuses on:** identifying trends in employee performance, satisfaction, and attrition using historical HR data.

- **Data Sets Features:**
  Employee, Attrition, Performance Rating, Education Level, Job Role,
  Rating Level, Satisfaction Level

- **The project goal:** To provide insights that will help management improve employee retention and performance through data-driven decisions.

INTRODUCTION

- **What is Attrition?**

Attrition refers to the natural reduction of employees in an organization due to resignations, retirements, layoffs, or other reasons. It reflects the turnover rate of the workforce over a specific period. While some level of attrition is normal and even healthy, high or unplanned attrition can disrupt operations, increase costs, and affect overall organizational stability.
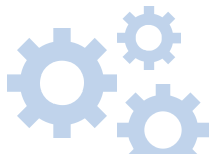
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1	Age	Attrition	BusinessTr	DailyRate	Departme	DistanceFi	Education	EducationField	EmployeeCount	EmployeeNumber	EnvironmentSatisfaction	Gender	HourlyRate	JobInvolve	JobLevel	JobRole	JobSatisfa	MaritalSta	MonthlyIn	Monthl
2	41	Yes	Travel_Ra	1102	Sales	1	2	Life Sciences	1	1	2	Female	94	3	2	Sales Exec	4	Single	5993	194
3	49	No	Travel_Fre	279	Research ¡	8	1	Life Sciences	1	2	3	Male	61	2	2	Research !	2	Married	5130	249
4	37	Yes	Travel_Ra	1373	Research ¡	2	2	Other	1	4	4	Male	92	2	1	Laborator	3	Single	2090	23
5	33	No	Travel_Fre	1392	Research ¡	3	4	Life Sciences	1	5	4	Female	56	3	1	Research !	3	Married	2909	231
6	27	No	Travel_Ra	591	Research ¡	2	1	Medical	1	7	1	Male	40	3	1	Laborator	2	Married	3468	166
7	32	No	Travel_Fre	1005	Research ¡	2	2	Life Sciences	1	8	4	Male	79	3	1	Laborator	4	Single	3068	118
8	59	No	Travel_Ra	1324	Research ¡	3	3	Medical	1	10	3	Female	81	4	1	Laborator	1	Married	2670	99
9	30	No	Travel_Ra	1358	Research ¡	24	1	Life Sciences	1	11	4	Male	67	3	1	Laborator	3	Divorced	2693	133
10	38	No	Travel_Fre	216	Research ¡	23	3	Life Sciences	1	12	4	Male	44	2	3	Manufactu	3	Single	9526	87
11	36	No	Travel_Ra	1299	Research ¡	27	3	Medical	1	13	3	Male	94	3	2	Healthcare	3	Married	5237	165
12	35	No	Travel_Ra	809	Research ¡	16	3	Medical	1	14	1	Male	84	4	1	Laborator	2	Married	2426	164
13	29	No	Travel_Ra	153	Research ¡	15	2	Life Sciences	1	15	4	Female	49	2	2	Laborator	3	Single	4193	126
14	31	No	Travel_Ra	670	Research ¡	26	1	Life Sciences	1	16	1	Male	31	3	1	Research !	3	Divorced	2911	151
15	34	No	Travel_Ra	1346	Research ¡	19	2	Medical	1	18	2	Male	93	3	1	Laborator	4	Divorced	2661	87
16	28	Yes	Travel_Ra	103	Research ¡	24	3	Life Sciences	1	19	3	Male	50	3	1	Laborator	3	Single	2028	129
17	29	No	Travel_Ra	1389	Research ¡	21	4	Life Sciences	1	20	2	Female	51	4	3	Manufactu	4	Divorced	9980	101
18	32	No	Travel_Ra	334	Research ¡	5	2	Life Sciences	1	21	1	Male	80	4	1	Research !	2	Divorced	3298	150
19	22	No	Non-Trave	1123	Research ¡	16	2	Medical	1	22	4	Male	96	4	1	Laborator	4	Divorced	2935	73
20	53	No	Travel_Ra	1219	Sales	2	4	Life Sciences	1	23	1	Female	78	2	4	Manager	4	Married	15427	220
21	38	No	Travel_Ra	371	Research ¡	2	3	Life Sciences	1	24	4	Male	45	3	1	Research !	4	Single	3944	43
22	24	No	Non-Trave	673	Research ¡	11	2	Other	1	26	1	Female	96	4	2	Manufactu	3	Divorced	4011	82
23	36	Yes	Travel_Ra	1218	Sales	9	4	Life Sciences	1	27	3	Male	82	2	1	Sales Repr	1	Single	3407	69
24	34	No	Travel_Ra	419	Research ¡	7	4	Life Sciences	1	28	1	Female	53	3	3	Research I	2	Single	11994	212
25	21	No	Travel_Ra	391	Research ¡	15	2	Life Sciences	1	30	3	Male	96	3	1	Research !	4	Single	1232	192
26	34	Yes	Travel_Ra	699	Research ¡	6	1	Medical	1	31	2	Male	83	3	1	Research !	1	Single	2960	171
27	53	No	Travel_Ra	1282	Research ¡	5	3	Other	1	32	3	Female	58	3	5	Manager	3	Divorced	19094	107

Task_Info WA_Fn-UseC_-HR-Employee-Attriti

	JobRole	JobSatisfa	MaritalSta	MonthlyIn	MonthlyR:	NumComp	Over18	OverTime	PercentSa	Performan	Relationsh	StandardH	StockOpti	TotalWorkingYears	TrainingTimesLastYear	WorkLifeBalance	YearsAtC	YearsInCu	YearsSince	YearsWithCurrMana
	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AJ
2	Sales Exec	4	Single	5993	19479	8	Y	Yes	11	3	1	80	0	8	0	1	6	4	0	5
3	Research S	2	Married	5130	24907	1	Y	No	23	4	4	80	1	10	3	3	10	7	1	7
4	Laborator	3	Single	2090	2396	6	Y	Yes	15	3	2	80	0	7	3	3	0	0	0	0
5	Research S	3	Married	2909	23159	1	Y	Yes	11	3	3	80	0	8	3	3	8	7	3	0
6	Laborator	2	Married	3468	16632	9	Y	No	12	3	4	80	1	6	3	3	2	2	2	2
7	Laborator	4	Single	3068	11864	0	Y	No	13	3	3	80	0	8	2	2	7	7	3	6
8	Laborator	1	Married	2670	9964	4	Y	Yes	20	4	1	80	3	12	3	2	1	0	0	0
9	Laborator	3	Divorced	2693	13335	1	Y	No	22	4	2	80	1	1	2	3	1	0	0	0
10	Manufactu	3	Single	9526	8787	0	Y	No	21	4	2	80	0	10	2	3	9	7	1	8
11	Healthcare	3	Married	5237	16577	6	Y	No	13	3	2	80	2	17	3	2	7	7	7	7
12	Laborator	2	Married	2426	16479	0	Y	No	13	3	3	80	1	6	5	3	5	4	0	3
13	Laborator	3	Single	4193	12682	0	Y	Yes	12	3	1	80	0	10	3	3	9	5	0	8
14	Research S	3	Divorced	2911	15170	1	Y	No	17	3	4	80	1	5	1	2	5	2	4	3
15	Laborator	4	Divorced	2661	8758	0	Y	No	11	3	3	80	1	3	2	3	2	2	1	2
16	Laborator	3	Single	2028	12947	5	Y	Yes	14	3	2	80	0	6	4	3	4	2	0	3
17	Manufactu	1	Divorced	9980	10195	1	Y	No	11	3	3	80	1	10	1	3	10	9	8	8
18	Research S	2	Divorced	3298	15053	0	Y	Yes	12	3	4	80	2	7	5	2	6	2	0	5
19	Laborator	4	Divorced	2935	7324	1	Y	Yes	13	3	2	80	2	1	2	2	1	0	0	0
20	Manager	4	Married	15427	22021	2	Y	No	16	3	3	80	0	31	3	3	25	8	3	7
21	Research S	4	Single	3944	4306	5	Y	Yes	11	3	3	80	0	6	3	3	3	2	1	2
22	Manufactu	3	Divorced	4011	8232	0	Y	No	18	3	4	80	1	5	5	2	4	2	1	3
23	Sales Repr	1	Single	3407	6986	7	Y	No	23	4	2	80	0	10	4	3	5	3	0	3
24	Research I	2	Single	11994	21293	0	Y	No	11	3	3	80	0	13	4	3	12	6	2	11
25	Research S	4	Single	1232	19281	1	Y	No	14	3	4	80	0	0	6	3	0	0	0	0
26	Research S	1	Single	2960	17102	2	Y	No	11	3	3	80	0	8	2	3	4	2	1	3
27	Manager	3	Divorced	19094	10735	4	Y	No	11	3	4	80	1	26	3	2	14	13	4	8

Task_Info   WA_Fn-UseC_-HR-Employee-Attriti
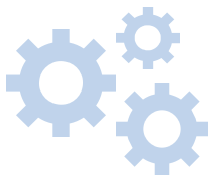
02

DATA CLEANING & EXPLORATION
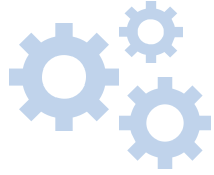
Imported Data Into Power BI, Transforming data then Load it..

Data Exploration Process

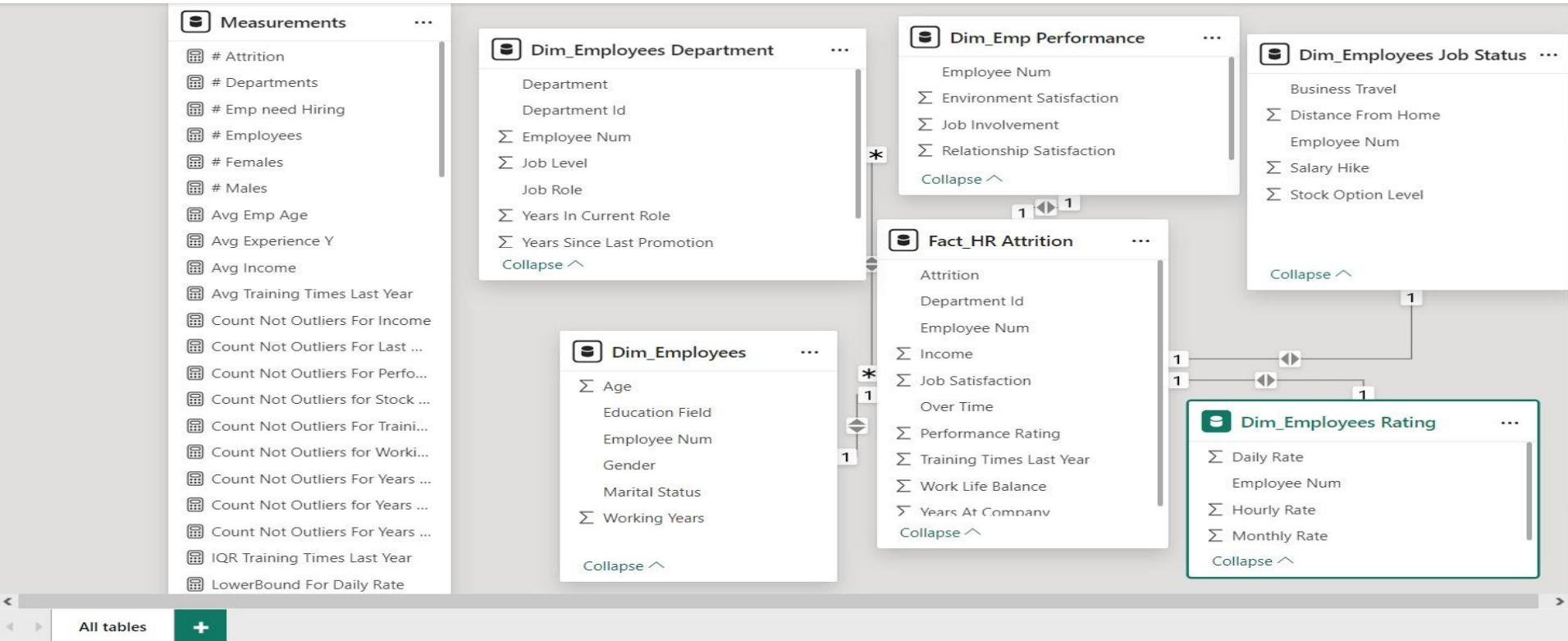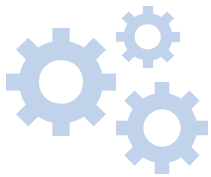Understanding the dataset's structure, distribution, and relationships

Data Cleaning Process

Removing duplicates, handling missing values, and ensuring proper data types

Making Star Schema using Power Query & Measures By DAX

Measurements ...

- # Attrition
- # Departments
- # Emp need Hiring
- # Employees
- # Females
- # Males
- Avg Emp Age
- Avg Experience Y
- Avg Income
- Avg Training Times Last Year
- Count Not Outliers For Income
- Count Not Outliers For Last ...
- Count Not Outliers For Perfo...
- Count Not Outliers for Stock ...
- Count Not Outliers For Traini...
- Count Not Outliers for Worki...
- Count Not Outliers For Years ...
- Count Not Outliers for Years ...
- Count Not Outliers For Years ...
- IQR Training Times Last Year
- LowerBound For Daily Rate

Dim_Employees Department ...

- Department
- Department Id
- Σ Employee Num
- Σ Job Level
- Job Role
- Σ Years In Current Role
- Σ Years Since Last Promotion

Collapse ∧

Dim_Emp Performance ...

- Employee Num
- Σ Environment Satisfaction
- Σ Job Involvement
- Σ Relationship Satisfaction

Collapse ∧

Dim_Employees Job Status ...

- Business Travel
- Σ Distance From Home
- Employee Num
- Σ Salary Hike
- Σ Stock Option Level

Collapse ∧

Fact_HR Attrition ...

- Attrition
- Department Id
- Employee Num
- Σ Income
- Σ Job Satisfaction
- Over Time
- Σ Performance Rating
- Σ Training Times Last Year
- Σ Work Life Balance
- Σ Years At Company

Collapse ∧

Dim_Employees ...

- Σ Age
- Education Field
- Employee Num
- Gender
- Marital Status
- Σ Working Years

Collapse ∧

Dim_Employees Rating ...

- Σ Daily Rate
- Employee Num
- Σ Hourly Rate
- Σ Monthly Rate

Collapse ∧

All tables

03

Dashboard & Analysis

HR Attrition Dashboard

# Employees	# Attrition	Avg Emp Age	Avg Income	Avg Experience Y
1470	**237**	**37**	**$7K**	**11**

Employees By Gender

- Female 588 (40%)
- Male 882 (60%)

Attrition By Age

Age	# Attrition
29	18
31	18
28	14
26	12
33	12
32	11
35	10
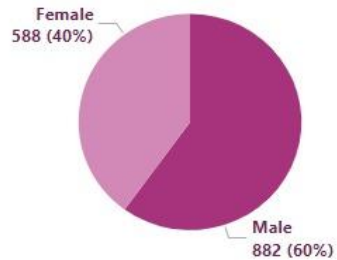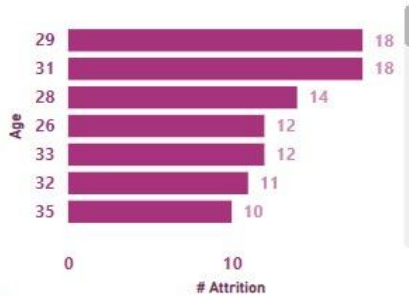
Attrition By Marital Status

Marital Status	# Attrition
Single	120
Married	84
Divorced	33

Attrition By Education Field

Education Field	# Attrition
Life Sciences	89
Medical	63
Marketing	35
Technical Degree	32
Other	11
Human Resources	7

Attrition By Job Role

Job Role	# Attrition
Manager	237
Healthcare Represent...	133
Laboratory Technician	133
Manufacturing Direc...	133
Research Director	133
Research Scientist	133
Sales Executive	92

Attrition By Department

- Human Resources 12 (5%)
- Sales 92 (3...)
- Research & Dev... 133 (56%)
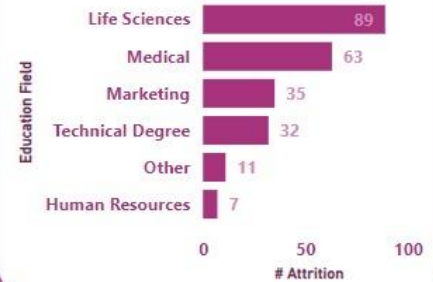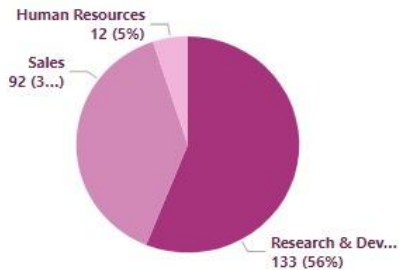
Attrition By Working Years

Working Years	# Attrition
1	40
10	25
6	22
7	18
5	16
8	16
4	12
9	10
2	9
3	9
11	7

Department Slicer

- Human Res...
- Research &...
- Sales

Attrition Dashboard | Details Dashboard | Rating Dashboard | #Attrition By Gender Tooltip | # Attrition By Department Tooltip | Training Times Last Ye...

HR Dashboard

1470 # Employees

237 # Attrition

3 # Departments

$7K Avg Income

11 Avg Experience Y

Employees By Department

- Research & Development: 961
- Sales: 446
- Human Resources: 63

#Employees By Business Travel

- Rarely: 1043
- Frequently: 277
- Non: 150
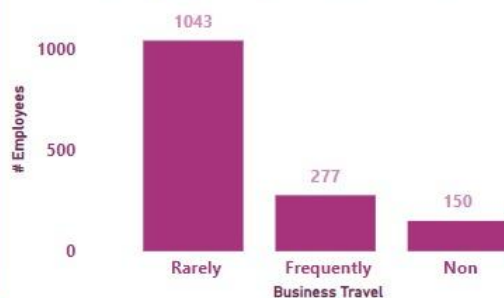
Employees By Distance From Home

- 2: 211
- 1: 208
- 10: 86
- 9: 85
- 3: 84
- 7: 84
- 8: 80

Salary Hike By Job Role

- Manager: 22K
- Healthcare R...: 15K
- Laboratory T...: 15K
- Manufacturi...: 15K
- Research Dir...: 15K
- Research Scie...: 15K
- Sales Executive: 7K

#Employees By Years At Company

- 5: 196
- 1: 171
- 3: 128
- 2: 127
- 10: 120
- 4: 110
- 7: 90
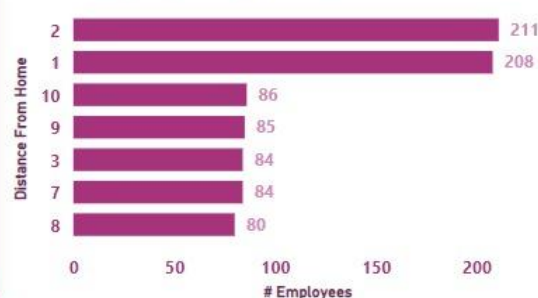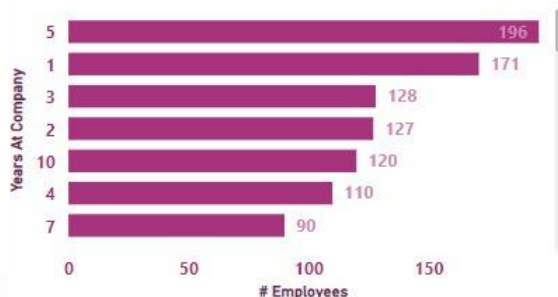
Over Time By Department

- Human Resources: 63 (4.29%)
- Sales: 446 (30.34%)
- Research & Development: 961 (65.37%)

Attrition Dashboard | Details Dashboard | Rating Dashboard | #Attrition By Gender Tooltip | # Attrition By Department Tooltip | Training Times Last Yea

HR Dashboard

1470	3	581	237	3
# Employees	# Departments	# Emp need Hiring	# Attrition	Avg Training Tim...

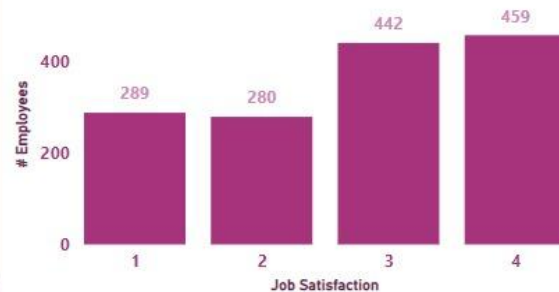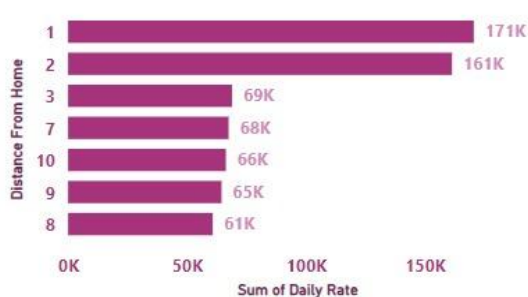## # Performance Rating by Job Role
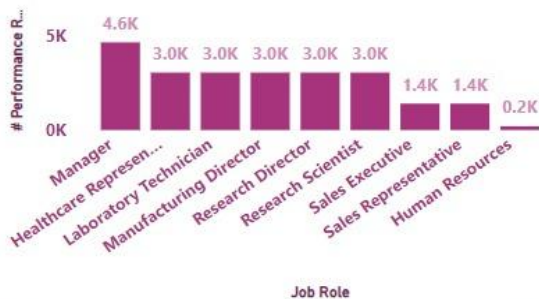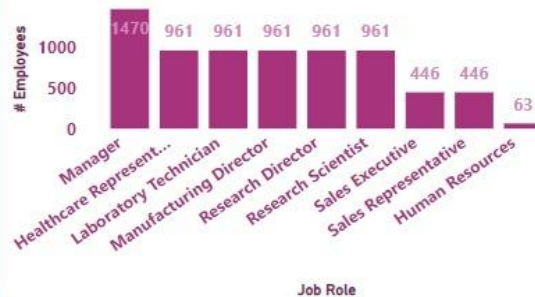

Employees by Work Life Balance
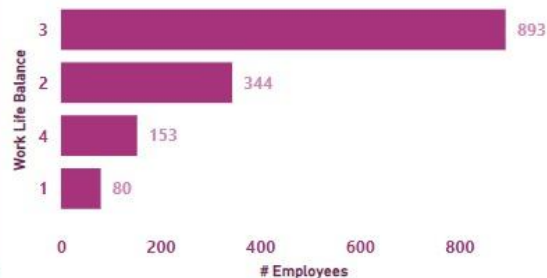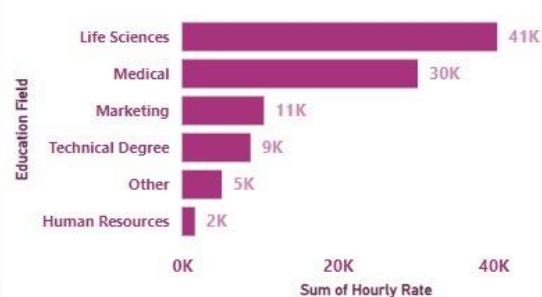

Employees by Job Satisfaction

Sum of Daily Rate by Distance From Home

Employees by Job Role
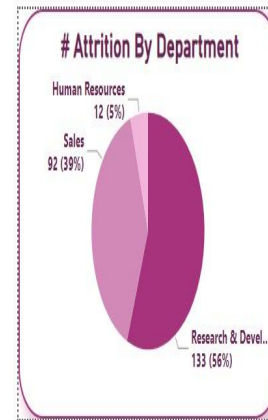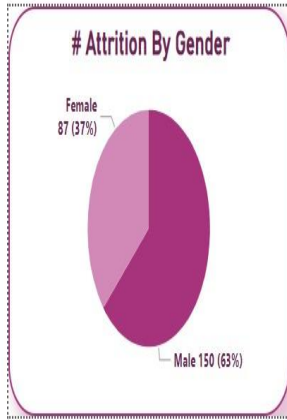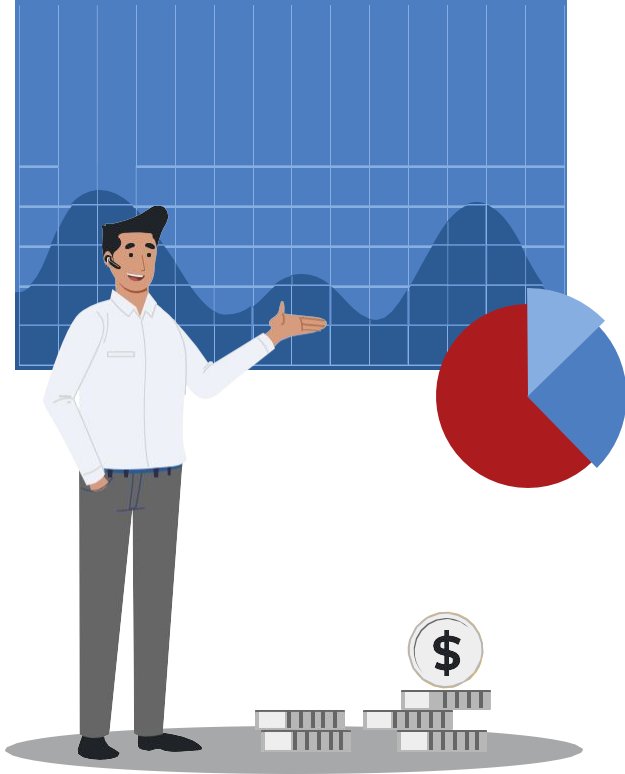

Sum of Hourly Rate by Education Field

Attrition Dashboard | Details Dashboard | **Rating Dashboard** | #Attrition By Gender Tooltip | # Attrition By Department Tooltip | Training Times Last Yea

Attrition By Gender

Female
87 (37%)

Male 150 (63%)

Attrition By Department

Human Resources
12 (5%)

Sales
92 (39%)

Research & Devel...
133 (56%)

Attrition Dashboard | Details Dashboard | Rating Dashboard | #Attrition By Gender Tooltip | # Attrition By Department Tooltip | Training Times Last Ye

Attrition Dashboard | Details Dashboard | Rating Dashboard | #Attrition By Gender Tooltip | # Attrition By Department Tooltip | Training Times Last Ye

Columns Contain Outliers:

1. Training Times Last Year
2. Working Years
3. Years At Company
4. Years At Curr Manag
5. Years Since Last Promotion
6. Income Outliers
7. Years In Current Role
8. Stock Option Level
9. Performance Rate

HR Dashboard

238
Outlier Count For Training

1232
Count Not Outliers For Training

Employee Num	Training Times Last Year	Outlier Count For Training ▼	Outlier Flag For Training Times
1	0	1	Outlier
2	0		Outlier
4	0		Outlier
5	0		Outlier
7	0		Outlier
8	0		Outlier
10	0		Outlier
11	0		Outlier
12	0		Outlier
13	0		Outlier
14	0		Outlier
15	0		Outlier
16	0		Outlier
18	0		Outlier
19	0		Outlier
Total		**238**	**Outlier**

## # Employees By Training Times Last Year
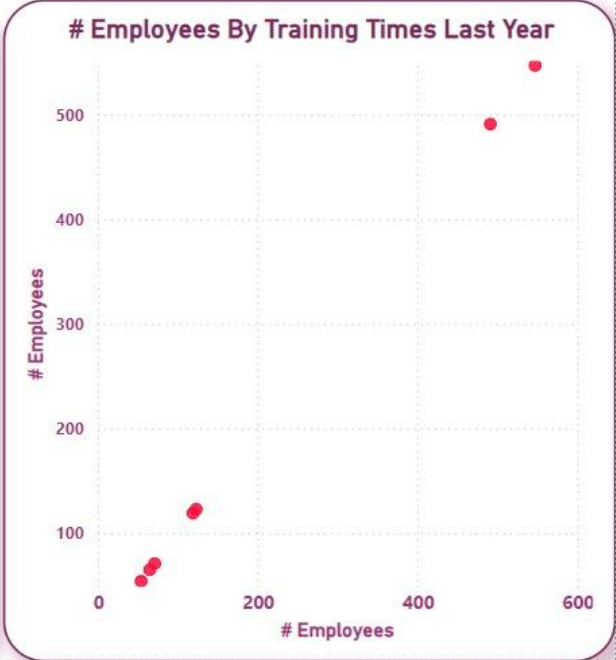
HR Dashboard

63
Outlier Count For Working Years

1407
Count Not Outliers for Working Years

Employee Num	Working Years	Outlier Count For Working Years	Outlier Flag Working Years
23	31	1	Outlier
80	29	1	Outlier
112	37	1	Outlier
131	38	1	Outlier
140	30	1	Outlier
165	40	1	Outlier
254	36	1	Outlier
259	34	1	Outlier
323	32	1	Outlier
329	33	1	Outlier
374	37	1	Outlier
505	30	1	Outlier
532	36	1	Outlier
546	31	1	Outlier
549	33	1	Outlier
Total		**63**	**Outlier**

Employees By Working Years
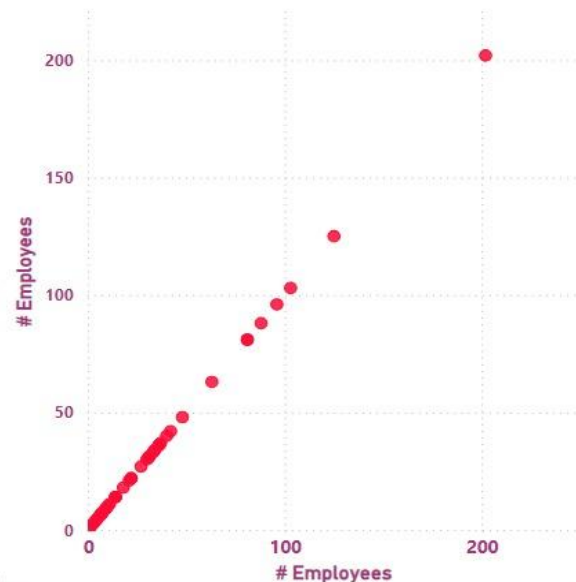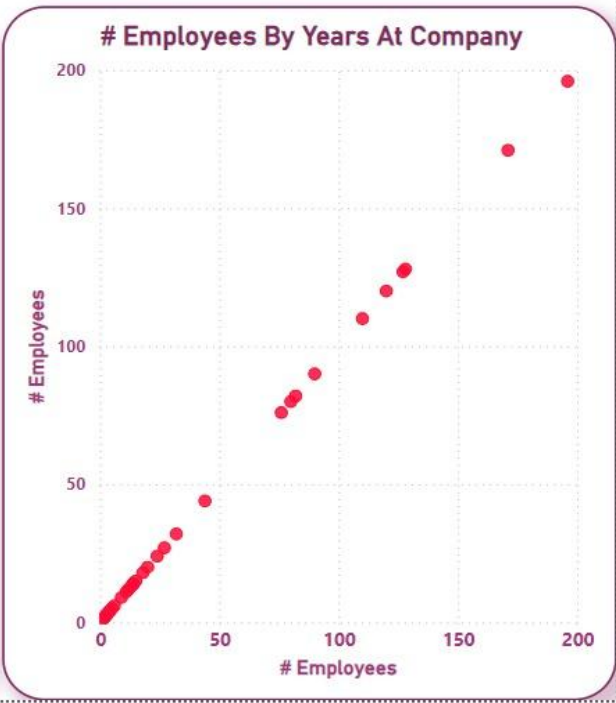
HR Dashboard

104
Outlier Count For Years At Company

1366
Count Not Outliers For Years At Company

Employee Num	Years At Company	Outlier Count For Years At Company	Outlier Flag For Years At Company ▼
23	25	1	Outlier
36	22	1	Outlier
58	22	1	Outlier
80	27	1	Outlier
81	21	1	Outlier
119	22	1	Outlier
131	37	1	Outlier
158	25	1	Outlier
162	20	1	Outlier
165	40	1	Outlier
202	20	1	Outlier
244	24	1	Outlier
253	20	1	Outlier
254	24	1	Outlier
259	33	1	Outlier
Total		**104**	**Outlier**

 # Employees By Years At Company

Employees (y-axis) vs # Employees (x-axis)

HR Dashboard

14

Outlier Count For Years At Curr Mang

1456

Count Not Outliers for Years At Curr Mang

Employee Num	Years At Company	Outlier Count For Years At Curr Mang	Outlier Flag For Years At Curr Mang
1	6	3	Outlier
2	10	11	Outlier
4	0	11	Outlier
5	8	11	Outlier
7	2	11	Outlier
8	7	11	Outlier
10	1	11	Outlier
11	1	11	Outlier
12	9	11	Outlier
13	7	11	Outlier
14	5	11	Outlier
15	9	11	Outlier
16	5	11	Outlier
18	2	11	Outlier
Total		**14**	**Outlier**

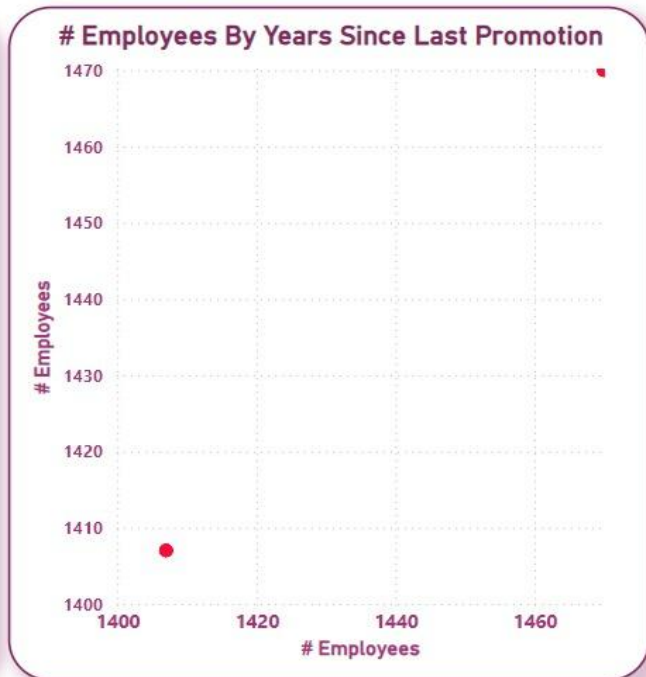**# Employees By Years With Curr Manager**

HR Dashboard

107
Outlier Count For Last Promotion

1363
Count Not Outliers For Last Promotion

Employee Num	Years Since Last Promotion	Outlier Count For Last Promotion	Outlier Flag For Last Promotion
1	1		Outlier
2	1		Outlier
4	1		Outlier
5	1		Outlier
7	1		Outlier
8	1		Outlier
10	1		Outlier
11	1		Outlier
12	1		Outlier
13	1		Outlier
14	1		Outlier
15	1		Outlier
16	1		Outlier
18	1		Outlier
19	1		Outlier
Total		**107**	**Outlier**

 # Employees By Years Since Last Promotion
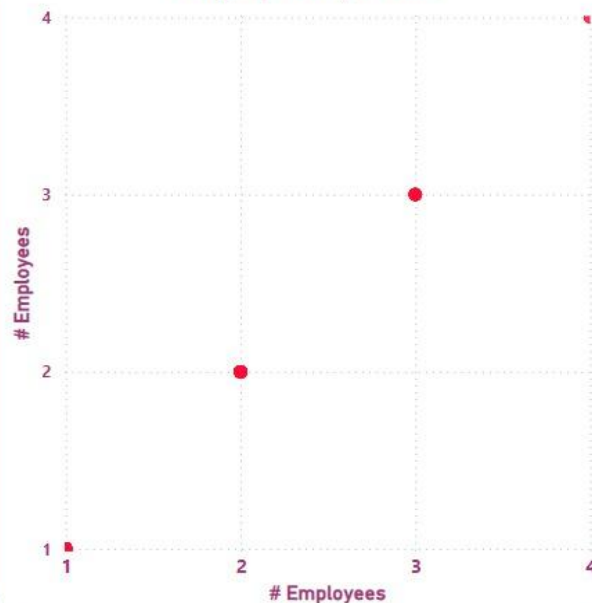
HR Dashboard

114
Outlier Count For Income

1356
Count Not Outliers For Income

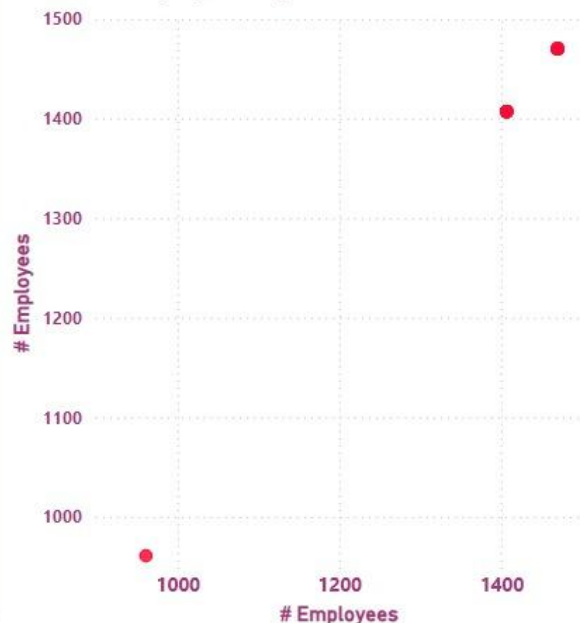| Employee Num	Income	Outlier Count For Income	Outlier Flag For Income ▼
32	$19,094	1	Outlier
38	$18,947	1	Outlier
58	$19,545	1	Outlier
80	$18,740	1	Outlier
140	$18,844	1	Outlier
141	$18,172	1	Outlier
148	$17,328	1	Outlier
158	$16,959	1	Outlier
162	$19,537	1	Outlier
199	$17,181	1	Outlier
226	$19,926	1	Outlier
253	$19,033	1	Outlier
254	$18,722	1	Outlier
259	$19,999	1	Outlier
264	$16,792	1	Outlier
Total		**114**	**Outlier**

Employees By Income

HR Dashboard

21
Outlier Count For Years In Curr Role

1449
Count Not Outliers For Years In Curr Role

Employee Num	Years In Current Role	Outlier Count For Years In Curr Role ▼	Outlier Flag For Years In Curr Role
2	15	6	Outlier
4	15	6	Outlier
5	15	6	Outlier
7	15	6	Outlier
8	15	6	Outlier
10	15	6	Outlier
11	15	6	Outlier
12	15	6	Outlier
13	15	6	Outlier
14	15	6	Outlier
15	15	6	Outlier
16	15	6	Outlier
18	15	6	Outlier
19	15	6	Outlier
Total		**21**	**Outlier**

Employees By Years In Curr Role

Years At Curr Manag Outliers | Years Since Last Promotion Outliers | Income Outliers | **Years In Curr Role Outliers** | Stock Option Level Outliers | Perfor
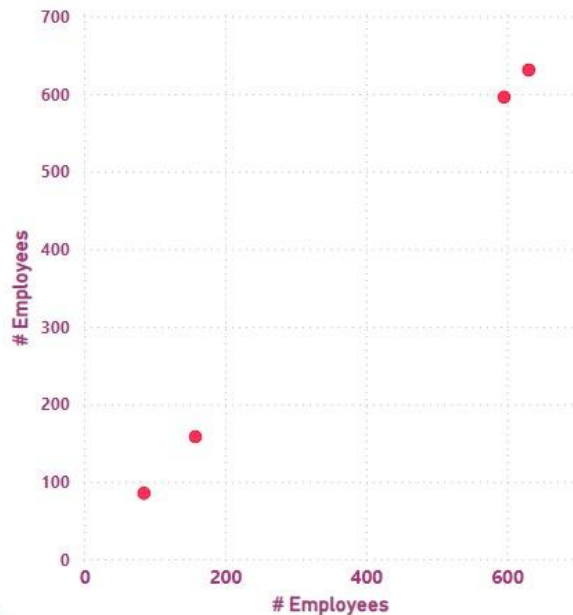
HR Dashboard

85
Outlier Count For Stock Option

1385
Count Not Outliers for Stock Option Lvel

Employee Num	Stock Option Level	Outlier Count For Stock Option	Outlier Flag For Stock Option Level
10	3	1	Outlier
83	3	1	Outlier
84	3	1	Outlier
107	3	1	Outlier
117	3	1	Outlier
121	3	1	Outlier
159	3	1	Outlier
161	3	1	Outlier
195	3	1	Outlier
244	3	1	Outlier
262	3	1	Outlier
283	3	1	Outlier
306	3	1	Outlier
332	3	1	Outlier
386	3	1	Outlier
Total		**85**	**Outlier**

Employees By Stock Option Level

HR Dashboard
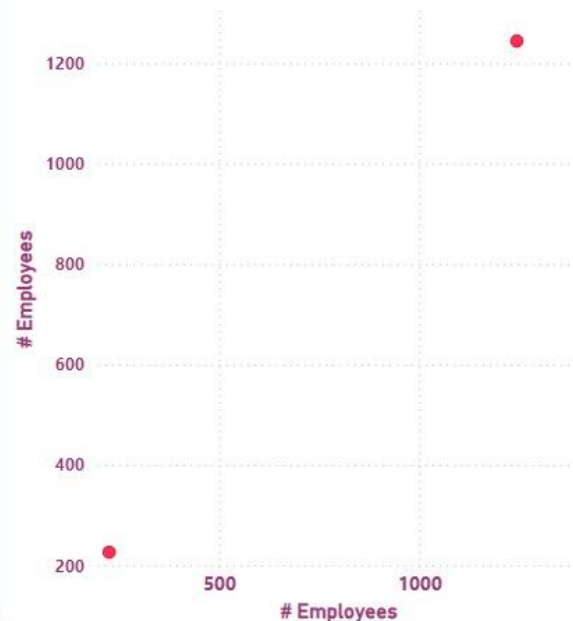
226
Outlier Count For Performance Rate

1244
Count Not Outliers For Performance Rate

Employee Num	Performance Rating	Outlier Count For Performance Rate	Outlier Flag For Performance Rate
2	4	1	Outlier
10	4	1	Outlier
11	4	1	Outlier
12	4	1	Outlier
27	4	1	Outlier
33	4	1	Outlier
57	4	1	Outlier
60	4	1	Outlier
61	4	1	Outlier
62	4	1	Outlier
68	4	1	Outlier
74	4	1	Outlier
76	4	1	Outlier
78	4	1	Outlier
94	4	1	Outlier
Total		**226**	**Outlier**

Employees By Performance Rating

Outliers   Years Since Last Promotion Outliers   Income Outliers   Years In Curr Role Outliers   Stock Option Level Outliers   Performance Rate Outliers

How I Calculate The Outliers?

Q1 = PERCENTILEX.INC('YourTable', 'YourTable'[YourColumn], 0.25) (first quartile).

Values that fall below Q1 - 1.5 * IQR or above Q3 + 1.5 * IQR are flagged as **outliers**.

Q3 = PERCENTILEX.INC('YourTable', 'YourTable'[YourColumn], 0.75) (third quartile).

IQR = 'YourTable'[Q3] - 'YourTable'[Q1]
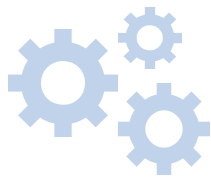
04

Conclusion

Recommendations

Bonus Policy

Implement a structured bonus system tied to performance and retention, especially in departments with high attrition rates.

Promotion & Career Growth

Create clearer promotion pathways and offer promotion opportunities to reduce turnover.

Employee Satisfaction

Invest in employee satisfaction program like Training to reduce attrition

THANK YOU!

Do you have any questions?

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