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# Human Resource Management

DEPI Round 2 (Oct-24 | May-25)





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# Agenda

01



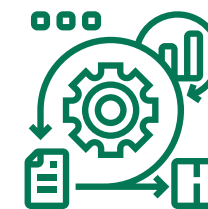
Introduction

02



Objective

03



Methodology

04



Insights





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01



**Introduction**

02



**Objective**

03



**Methodology**

04



**Insights**





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# Introduction

This Presentation examines workforce trends within a company that delivers HR solutions. By identifying patterns behind employee departures and their potential impact, the insights gained support data-driven decisions to enhance talent retention, optimize HR strategies, and strengthen advisory capabilities for clients.







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01



Introduction

02



Objective

03



Methodology

04



Insights





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# Objectives



**Examine HR Issues That Companies Aim to Solve or Improve**



**Analyze HR Data In order To have A great Overview for Data and identify The Issues Or the Area's For Improvement**



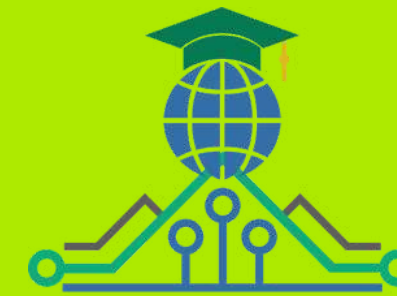
**Deliver Insights and Recommendations for Companies to improve There HR Management Systems**







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01



Introduction

02



Objective

03



Methodology

04



Insights





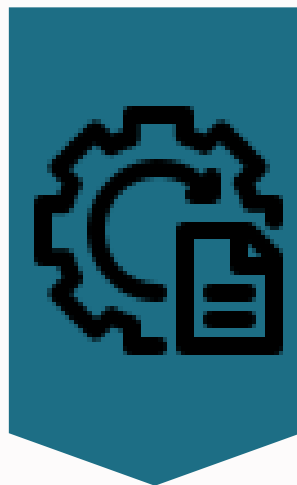
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# Methodology



## dataset

- About dataset
- Dataset description



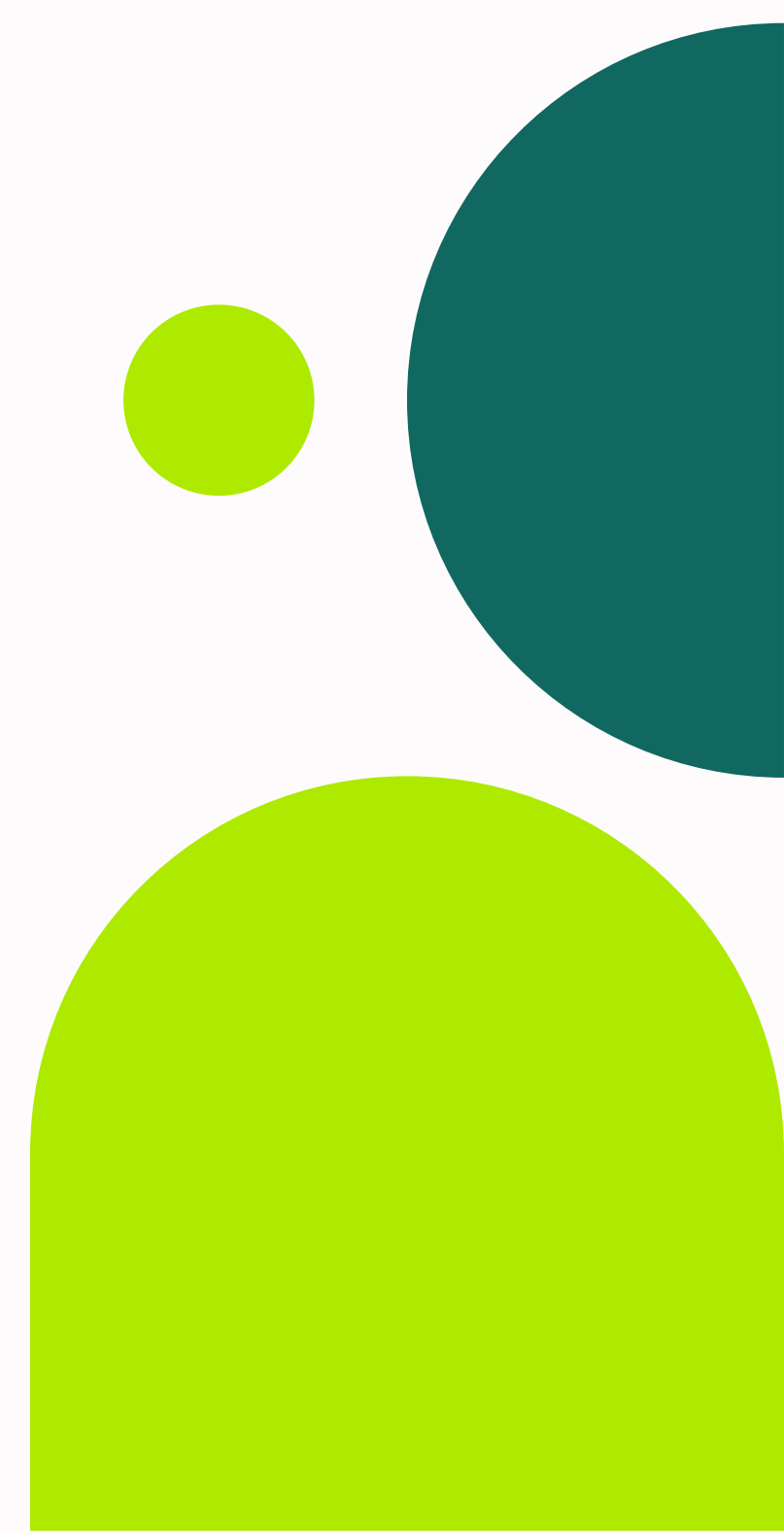
## Data preprocessing

- Data Preparation
- Data Cleaning & Preprocessing
- Data modeling



## Data Analysis

- EDA
- Data visualization







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**DATASET**





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# About the dataset

The dataset is provided by DEPI in 5 separated sheets in csv format named by

- EducationLevel.csv
- Employee.csv
- PerformanceRating.csv
- RatingLevel.csv
- SatisfiedLevel.csv





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# DATASET DESCRIPTION

DATASET







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# Employee

Total Records: 1,470 employees

Total Columns: 23

EmployeeID	Name	Gender	Age	BusinessTravel	DistanceFromHome	State	Ethnicity	EducationLevelID	EducationField
001A-8F88	Christy Jumel	Male	22	Some Travel		40 California	White	4	Information Systems
005C-E0FB	Fin O'Halleghane	Non-Binary	24	Frequent Traveller		17 California	White	4	Marketing
00A3-2445	Wyatt Ziehm	Male	30	Some Travel		6 California	Black or African American	2	Computer Science
00B0-F199	Trueman Jirasek	Male	23	Some Travel		35 California	White	1	Marketing
00D4-DD53	Joyce Goor	Female	30	Frequent Traveller		44 California	Black or African American	1	Computer Science
00E4-3D60	Sherilyn Girke	Female	30	Frequent Traveller		37 California	White	1	Business Studies
0145-DBFC	Keelia Studde	Female	34	No Travel		8 California	Asian or Asian American	4	Information Systems
0172-B5D2	Ketti Keighley	Female	27	Some Travel		28 California	White	4	Computer Science
017D-0B97	Maison Werndley	Male	20	Some Travel		39 California	White	2	Technical Degree
018B-DF1E	Otha Sopper	Female	19	Some Travel		1 California	White	1	Economics
0210-E0D8	Yankee Charteris	Male	36	Some Travel		7 New York	White	3	Technical Degree
022A-0219	Francine Fernez	Female	32	Frequent Traveller		14 Illinois	American Indian or Alaska Native	3	Business Studies
0240-4D29	Kaylil Blenkiron	Non-Binary	35	Some Travel		31 California	Asian or Asian American	4	Computer Science
02DA-7A72	Tadeas Lackney	Male	29	Frequent Traveller		42 California	White	3	Technical Degree
0317-B7BC	Ronni Beechcraft	Female	23	Some Travel		7 Illinois	White	4	Marketing
0322-D46B	Nikolas Leslie	Male	32	Some Travel		39 California	Black or African American	4	Marketing
0375-2F04	Lani Raddenbury	Female	19	No Travel		38 Illinois	White	4	Technical Degree
03C5-51AD	Maxie Banker	Female	25	Some Travel		1 Illinois	White	2	Computer Science
03D3-AA88	Mycah Brolechan	Male	23	Some Travel		8 New York	White	4	Other
03D5-622D	Aurora Whate	Female	21	No Travel		43 California	White	1	Marketing
03D9-FF08	Lynnette Portinari	Non-Binary	22	Some Travel		30 California	White	4	Other
03EF-5904	Shepperd Brittain	Male	31	Some Travel		45 Illinois	American Indian or Alaska Native	3	Other
040C-EDED	Lonnie Braxton	Male	22	Frequent Traveller		45 California	White	2	Computer Science
041A-31B0	Gerri Fullerlove	Female	34	Some Travel		41 New York	Black or African American	3	Computer Science
04D3-B8D3	Ann Sivorn	Female	24	Frequent Traveller		23 New York	White	4	Computer Science





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# Performance Rating Dataset

**Total Records: 6,709** performance reviews

**Columns (11):** Captures employee satisfaction and rating evaluation.

PerformanceID	EmployeeID	ReviewDate	EnvironmentSatisfaction	JobSatisfaction	RelationshipSatisfaction	TrainingOpportunitiesWithinYear	TrainingOpportunitiesTaken	WorkLifeBalance	SelfRating
PR01	79F7-78EC	01/02/2013	5	4	5	1	0	4	4
PR02	B61E-0F26	01/03/2013	5	4	4	1	3	4	4
PR03	F5E3-48BB	01/03/2013	3	4	5	3	2	3	5
PR04	0678-748A	01/04/2013	5	3	2	2	0	2	3
PR05	541F-3E19	01/04/2013	5	2	3	1	0	4	4
PR06	F93E-BDEF	01/04/2013	3	3	2	2	0	4	4
PR07	9E7A-1F70	01/08/2013	3	4	5	2	1	5	4
PR08	05ED-92F1	01/10/2013	4	5	4	1	1	3	3
PR09	F72D-261D	01/10/2013	4	5	2	1	1	4	5
PR10	774E-685D	01/11/2013	5	4	3	2	3	4	5
PR100	B013-7D0C	04/10/2013	4	3	3	2	0	4	3
PR1000	528C-3E0D	3/16/2016	4	4	2	2	2	4	5
PR1001	D077-169C	3/17/2016	3	5	3	2	2	3	5
PR1002	9727-BC84	3/18/2016	4	3	3	2	2	2	4
PR1003	DA8E-9496	3/18/2016	3	5	4	1	0	5	5
PR1004	DEC5-9319	3/18/2016	3	4	3	2	3	2	4
PR1005	88B8-EB84	3/19/2016	3	4	2	3	1	4	5
PR1006	9C57-828C	3/19/2016	5	4	2	1	1	2	3
PR1007	E1B4-9AA1	3/22/2016	5	4	3	3	2	3	4
PR1008	3CD6-5587	3/23/2016	5	4	2	2	0	4	4
PR1009	BAFA-86DF	3/23/2016	3	3	4	2	1	2	3
PR101	152E-8DB1	04/12/2013	5	2	5	1	0	5	5
PR1010	C6D7-A568	3/23/2016	4	2	3	3	0	2	4
PR1011	5160-53BD	3/24/2016	4	2	5	1	2	2	5
PR1012	81FF-8D6C	3/24/2016	3	4	3	2	0	4	5





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# Education Level Dataset

EducationLevelID	EducationLevel
1	No Formal Qualifications
2	High School
3	Bachelors
4	Masters
5	Doctorate

# Rating Level Dataset

RatingID	RatingLevel
1	Unacceptable
2	Needs Improvement
3	Meets Expectation
4	Exceeds Expectation
5	Above and Beyond





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# Satisfaction Level Dataset

SatisfactionID	SatisfactionLevel
1	Very Dissatisfied
2	Dissatisfied
3	Neutral
4	Satisfied
5	Very Satisfied





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# DATA PREPROCESSING

DATASET



DATASET DESCRIPTION





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# Data cleaning and Processing







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# Data Processing

- Data Mismatch

EducationField	Department	JobRole	MaritalStatu	Salary
Marketing	Technology	Sales Executive	Single	140158



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# Preprocessing Using Excel



EmployeeID	Name	Gender	Age	BusinessTravel	DistanceFromHome	State	Ethnicity
<div> <div>Valid</div> <div>Error</div> <div>Empty</div> </div> <div>100%</div> <div>0%</div> <div>0%</div>	<div> <div>Valid</div> <div>Error</div> <div>Empty</div> </div> <div>100%</div> <div>0%</div> <div>0%</div>	<div> <div>Valid</div> <div>Error</div> <div>Empty</div> </div> <div>100%</div> <div>0%</div> <div>0%</div>	<div> <div>Valid</div> <div>Error</div> <div>Empty</div> </div> <div>100%</div> <div>0%</div> <div>0%</div>	<div> <div>Valid</div> <div>Error</div> <div>Empty</div> </div> <div>100%</div> <div>0%</div> <div>0%</div>	<div> <div>Valid</div> <div>Error</div> <div>Empty</div> </div> <div>100%</div> <div>0%</div> <div>0%</div>	<div> <div>Valid</div> <div>Error</div> <div>Empty</div> </div> <div>100%</div> <div>0%</div> <div>0%</div>	<div> <div>Valid</div> <div>Error</div> <div>Empty</div> </div> <div>100%</div> <div>0%</div> <div>0%</div>
1000 distinct, 1000 unique	1000 distinct, 1000 unique	4 distinct, 0 unique	34 distinct, 1 unique	3 distinct, 0 unique	45 distinct, 0 unique	3 distinct, 0 unique	7 distinct, 0 unique
001A-8F88	Christy Jumel	Male	22	Some Travel	40	California	White
005C-E0FB	Fin O'Halleghane	Non-Binary	24	Frequent Traveller	17	California	White
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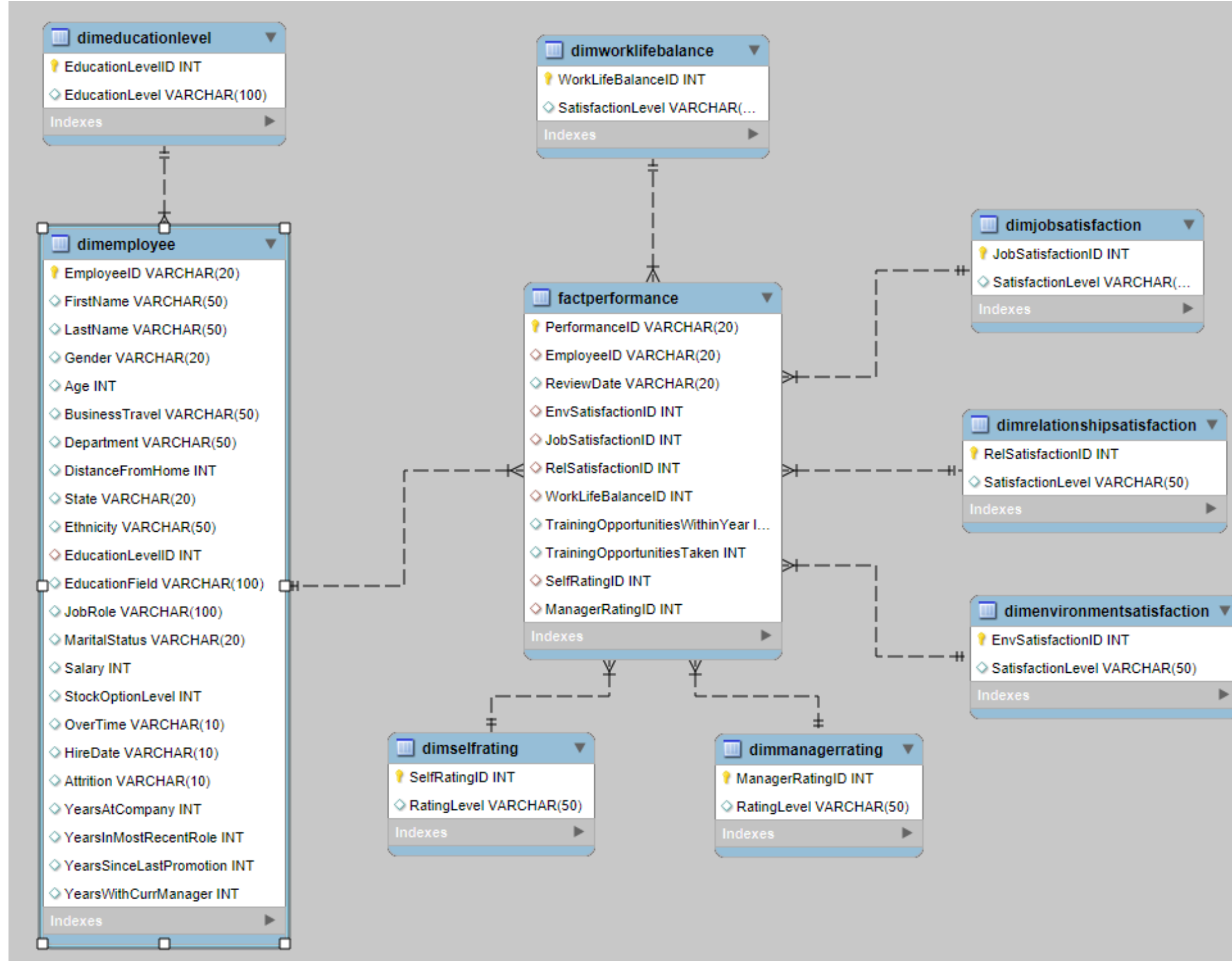


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# Dashboard Using Excel









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# Data Modelling

## 1-Preparing data

- Using MySQL For creating database
- creating tables for each csv file



## 2-Data Engineering

- Developing 4 new Dimension tables to avoid data Redundancy

## 3-Modeling Outcome

- Fact table: Performance Table
- 7 Dimensions connected to the fact



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# DATA ANALYSIS

DATASET



DATASET DESCRIPTION



DATA PREPROCESSING





# Exploratory data analysis(4 W's)

1

## **What happened? (Descriptive Analytics)**

EDA Question: What is the overall attrition rate in the company?

2

## **Why did it happen? (Diagnostic Analytics)**

EDA Question: What factors contribute most to employee attrition?

3

## **What will happen? (Predictive Analytics)**

EDA Question: If trends continue, which departments will have the highest attrition next year?

4

## **What should we do? (Prescriptive Analytics)**

EDA Question: How can HR reduce employee attrition?



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# Exploratory data analysis



1

## How the problem happened?

EDA Question: What are the main reasons employees leave the company?

2

## How long it may last?

EDA Question: If no changes are made, how long will high attrition persist?

3

## How to solve the problem?

EDA Question: What policies or incentives can reduce employee turnover?

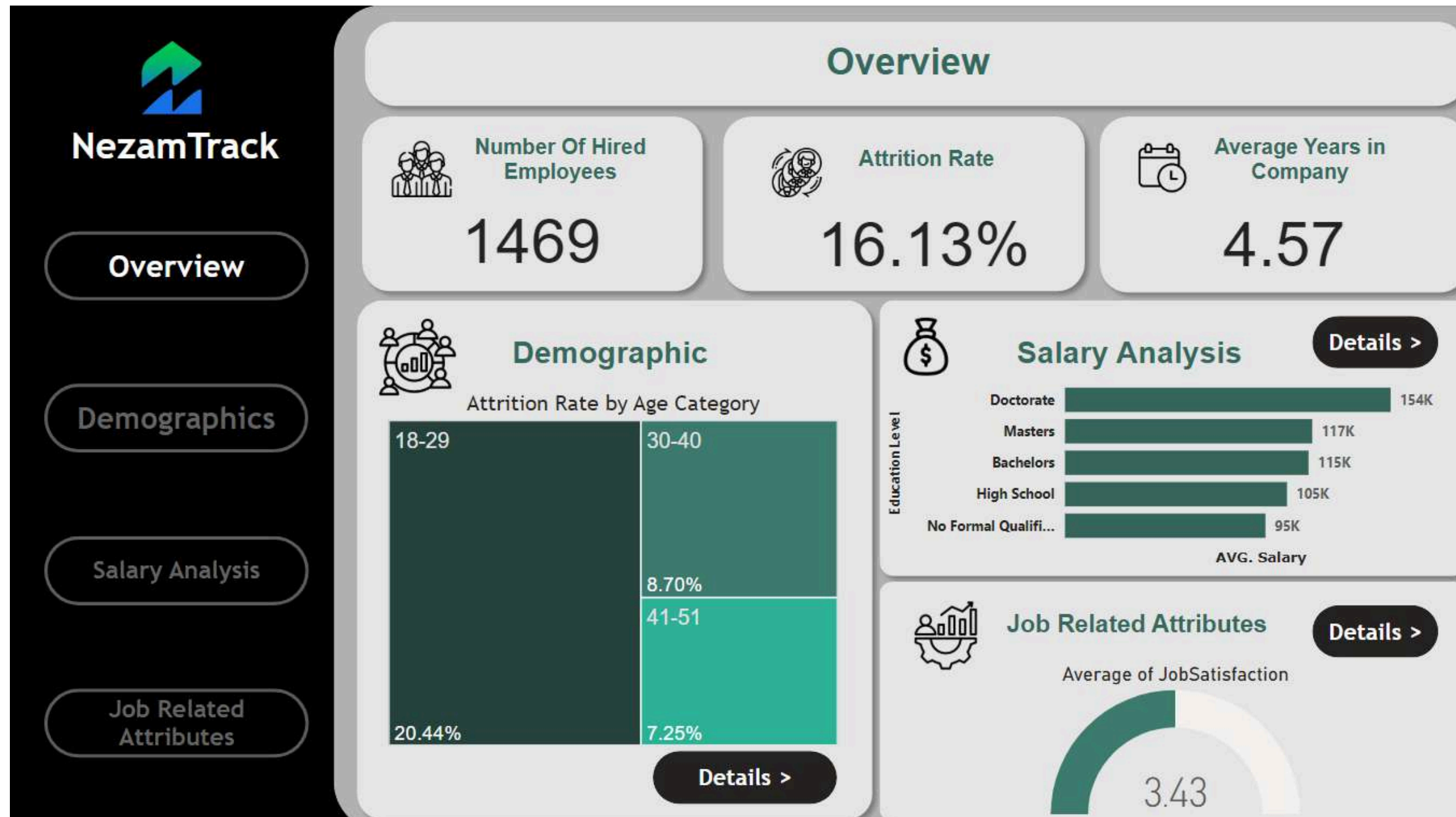






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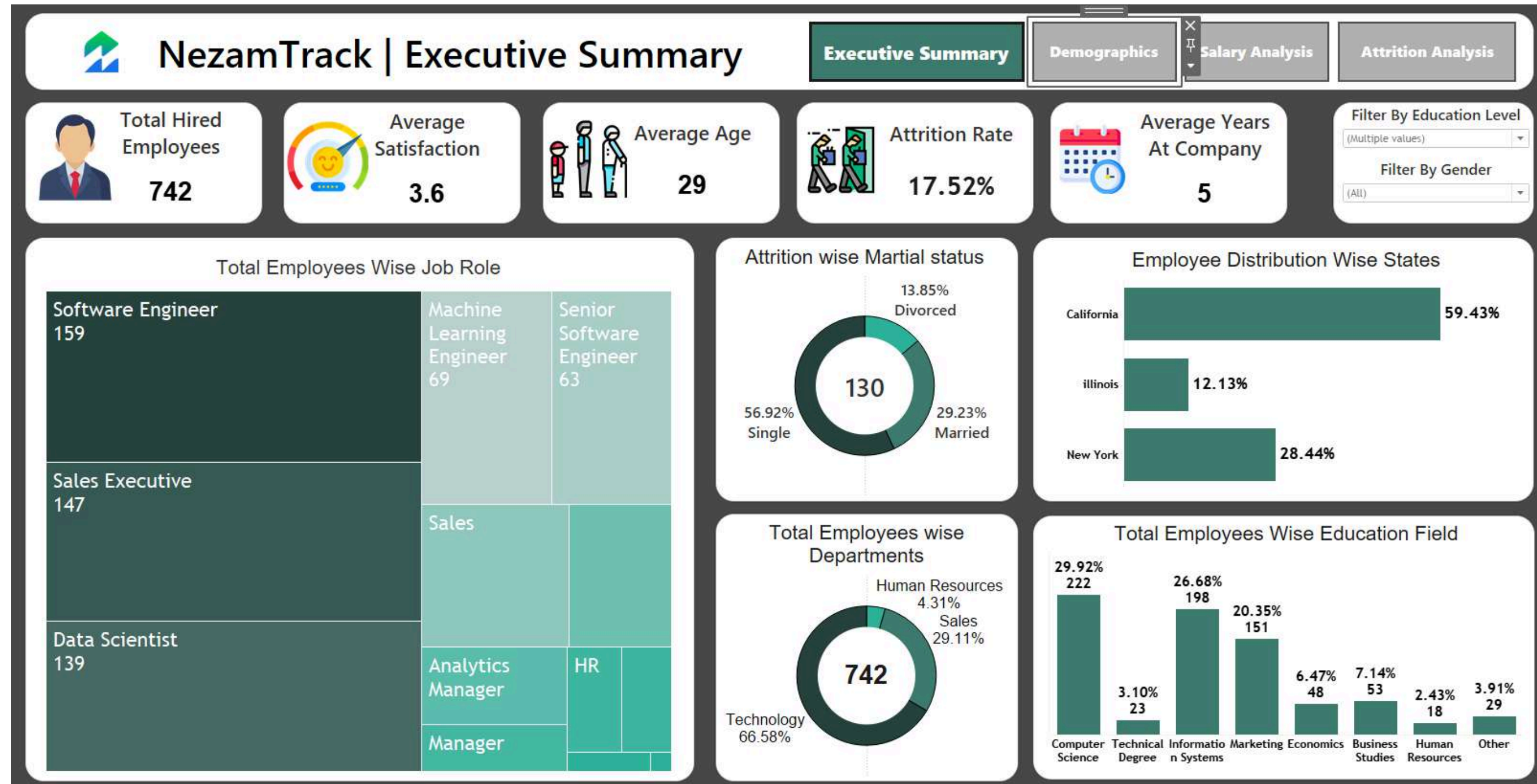
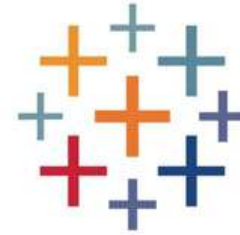
# Data Visualizations





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# Data Visualizations







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01



Introduction

02



Objective

03



Methodology

04



Insights





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# Data Visualization and key insights

What is the overall attrition rate in the company?

Attrition Count

237

Attrition Rate

19%

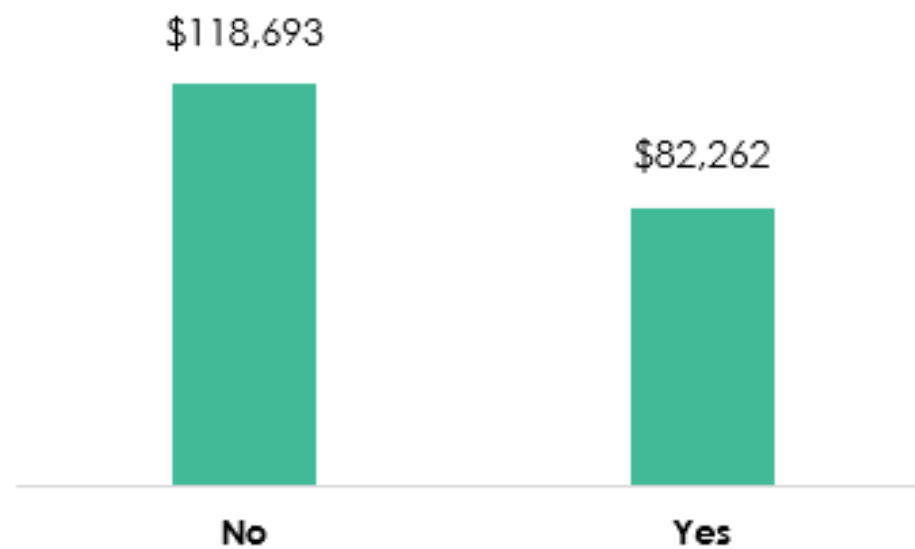
**Company Reputation is at high risk**



# Data Visualization and key insights

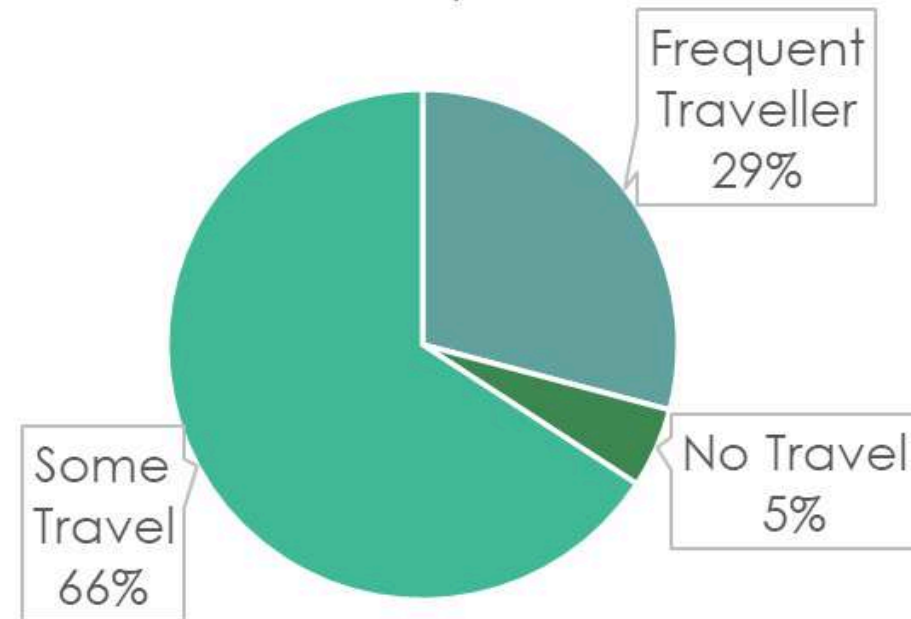
What factors contribute most to employee attrition?

Attrition by salary (Avg.)



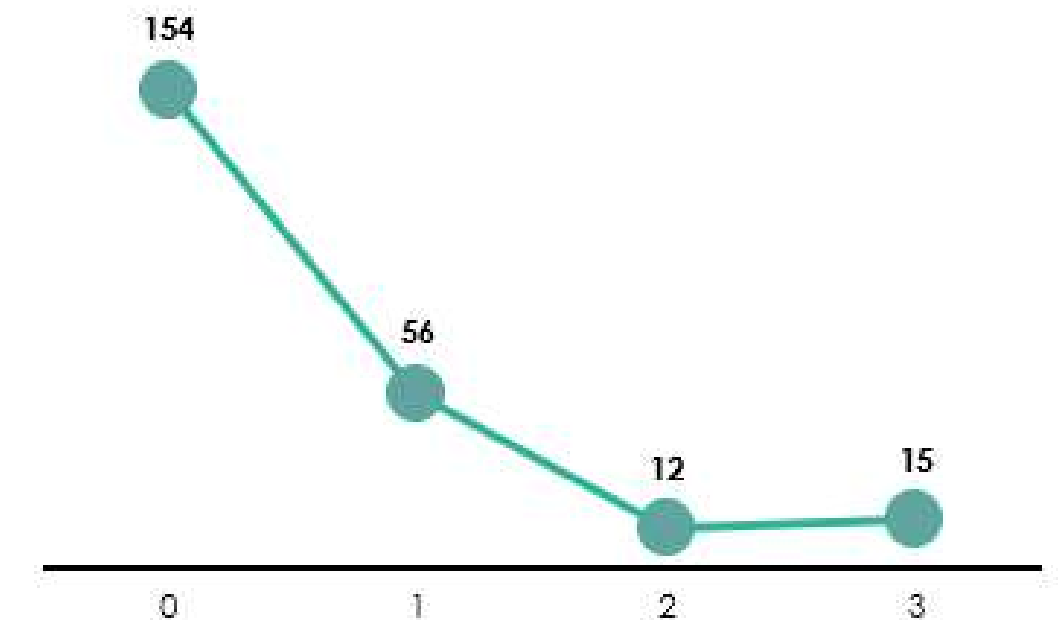
**30%** Salary Gap may be the highest factor affecting the attrition rate

Attrition by Travel



As Some travel is the most, this may not be a Strong factor affecting the attrition

Attrition by StockOption Level



Lack of Stock option level may cause employees to leave the company



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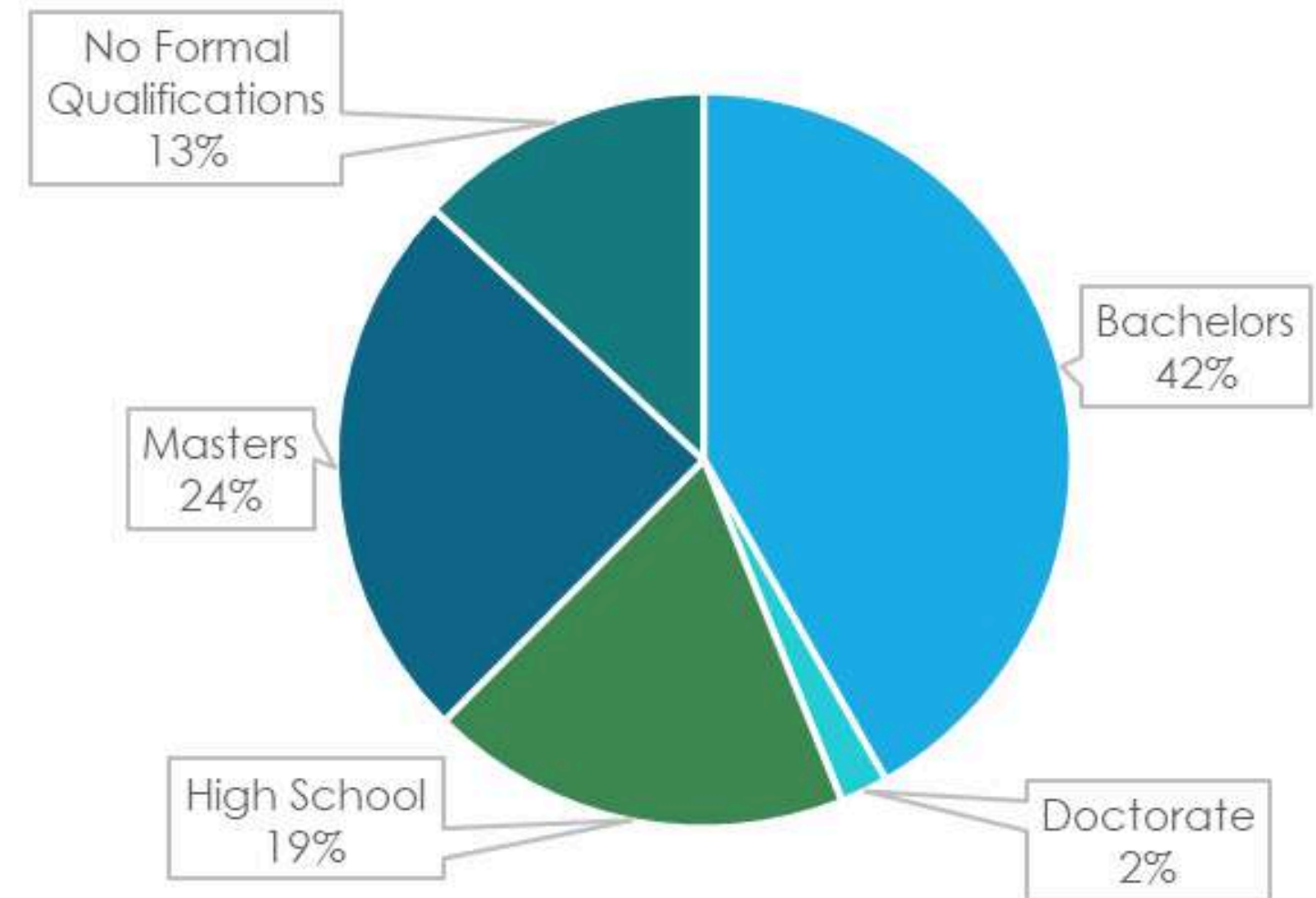


# Data Visualization and key insights

What factors contribute most to employee attrition?

Education level show seems to be in equal with high ratio at bachelor, which may be also a weak factor for attrition

Attrition by education level

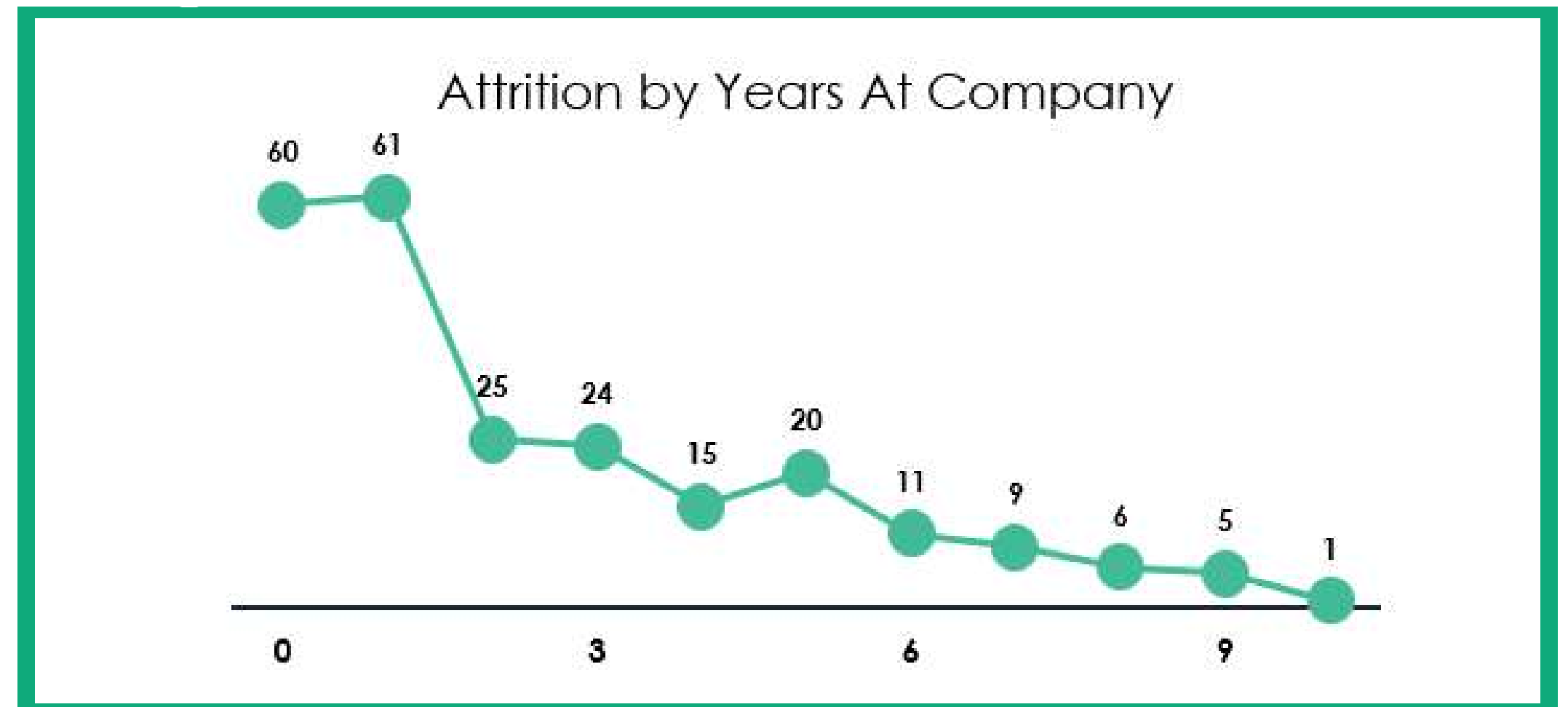




# Data Visualization and key insights

What factors contribute most to employee attrition?

**Years at company could be a crucial factor for de-influencing attrition rate**



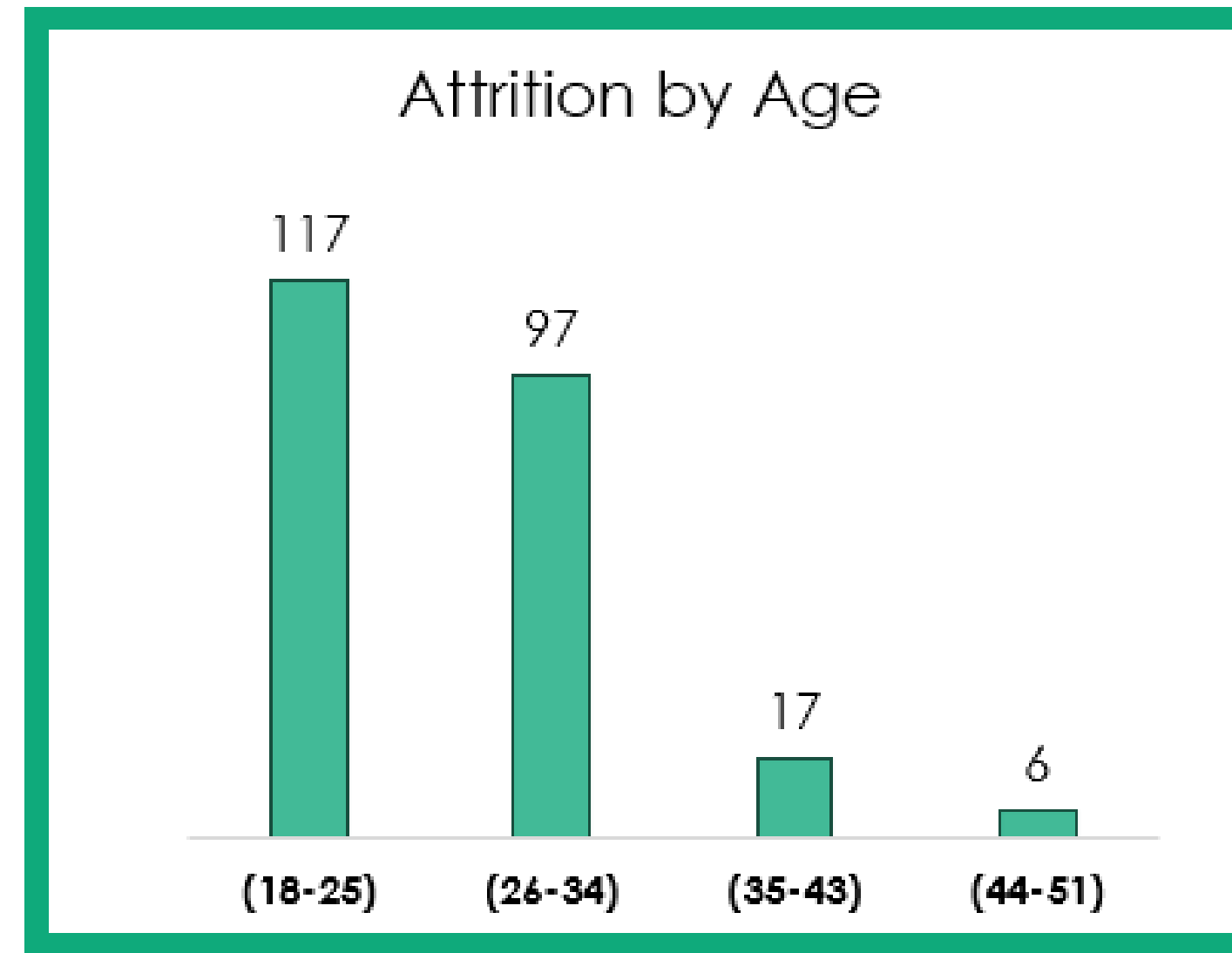


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# Data Visualization and key insights

**High-Risk Groups: Employees aged 18-34, single employees, and those with no stock options.**



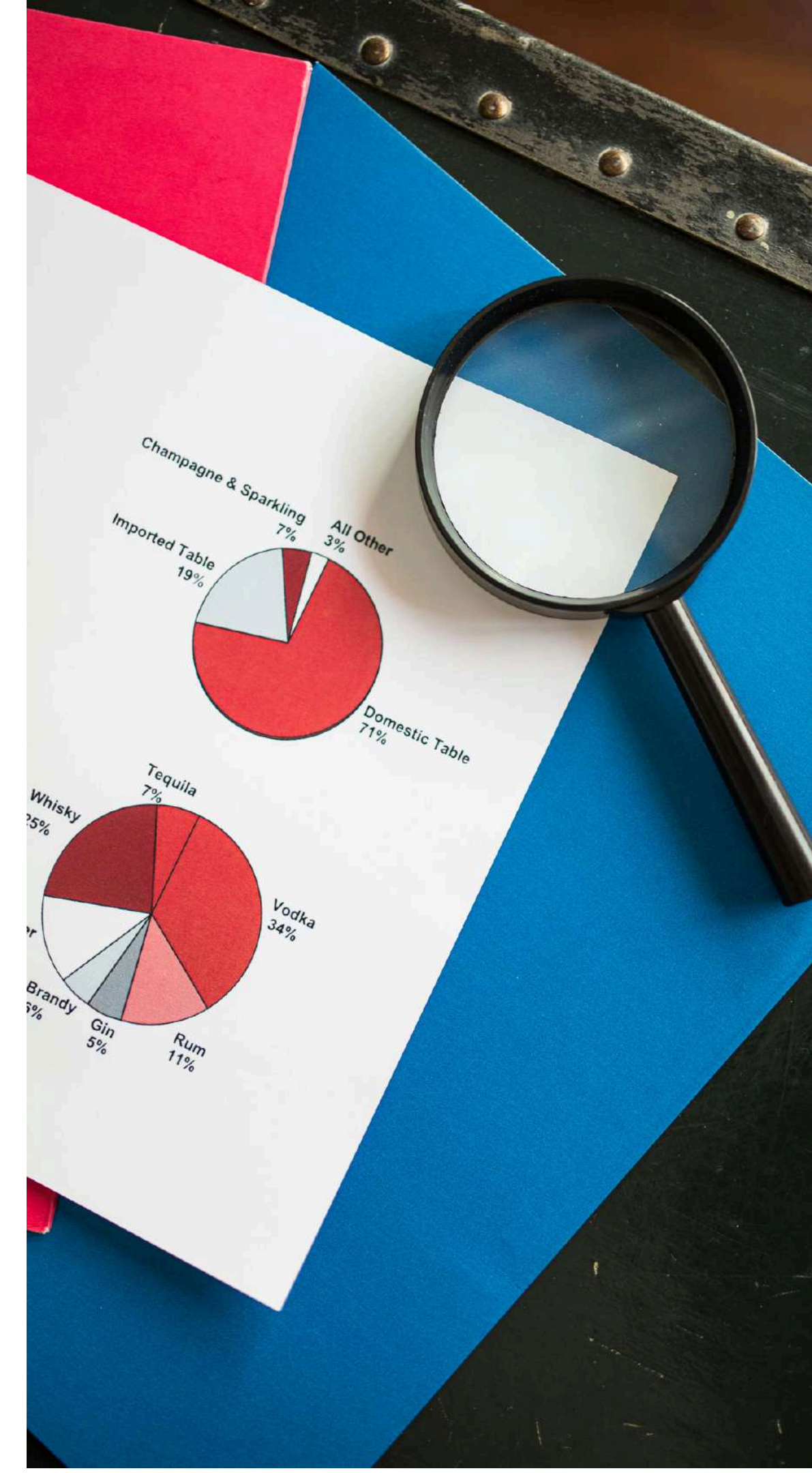
# Conclusion and Recommendation

**Establish New salary policies to maintain balance between employees**

**Improve onboarding & career development for new hires**

**Offer stock options to more employees to improve long-term retention.**

**Targeted retention programs for younger employees and high-turnover roles (sales, recruitment).**





# Q & A



