Human Resource Analysis Project

Technical Provider: ACICT- AST

Instructor: Ahmed Abd Ellatife

Team Members and Their Tasks

- **Team Members:**

1. **Mohamed Alaa Eldin Mohamed Ibrahim**
    1. Task: Answer analysis questions using SQL, explore data to help add some data points in python, perform statistical analysis on the dataset and assist with data analysis by writing Conclusion & Recommendations.
2. **Kerollos Girgis Dawoud**
    1. Task: Clean the dataset using Python and assist with data analysis.
3. **Raneem Essam Abdelwahed**
    1. Task: Answer analysis questions in Python, create visuals using Python, and assist in data analysis.
4. **Mohanad Mohamed Yasser**
    1. Task: Create the project blueprint and assist in data analysis.
5. **Nariman Mohamed Saad**
    1. Task: Build the Tableau dashboard and assist in data analysis.

- **Note:**
- Each team member contributed to writing their respective parts of the final report.

Project Overview

- ***Project Title*** : Human Resource Analysis

- ***Objective*** :

 - Analyze HR data to uncover insights related to employee turnover, performance ratings, and other key HR metrics. The analysis will help decision-makers understand workforce trends and try to predict future outcomes .

- ***Tools Used*** :

 Python (Pandas, Matplotlib)

 SQL

 Tableau for dashboard visualization

Data Overview

- ***Number of Employees(Rows):*** **8,767**

Key Columns:

- Employee ID
- First Name
- Last Name
- Gender
- State
- City
- Education Level
- Birthdate
- Hire Date
- Term Date
- Department
- Job Title
- Salary
- Performance Rating

	Employee_ID	First Name	Last Name	Gender	State	City	Education Level	Birthdate	Hiredate	Termdate	Department	Job Title	Salary	Performance Rating
0	00-95822412	Danielle	Johnson	0	New York	New York City	High School	13/02/1980	2016-04-16	5/7/2021	Customer Service	Help Desk Technician	81552	1
1	00-42868828	John	Taylor	1	North Carolina	Charlotte	Bachelor	22/09/1987	2017-02-09	14/06/2019	IT	System Administrator	107520	3
2	00-83197857	Erica	Mcclain	1	New York	New York City	Bachelor	19/05/1994	2016-02-03	6/3/2021	Operations	Logistics Coordinator	61104	3
3	00-13999315	Brittany	Johnson	1	New York	New York City	Bachelor	18/04/1980	2016-02-06	6/11/2018	Operations	Inventory Specialist	73770	3
4	00-90801586	Jeffery	Wagner	0	New York	New York City	Bachelor	7/4/1985	2015-01-11	NaN	Operations	Operations Analyst	55581	2
5	00-97226012	Anna	Baldwin	0	New York	New York City	Bachelor	31/05/1988	2022-09-30	29/03/2023	Operations	Operations Analyst	73800	3
6	00-70291817	Amy	Robinson	1	New York	New York City	Bachelor	16/07/1991	2020-08-16	12/2/2021	Finance	Accountant	68181	3
7	00-31429110	Joshua	Booth	0	New York	New York City	Bachelor	19/09/1995	2022-10-22	20/04/2023	Finance	Accounts Payable Specialist	54499	3
8	00-30868105	Linda	Wolfe	1	New York	New York City	High School	11/5/2002	2017-05-13	15/11/2021	Operations	Inventory Specialist	57340	1
9	00-22448136	Joshua	Lewis	0	New York	New York City	Bachelor	21/11/1980	2018-10-24	30/03/2022	Operations	Logistics Coordinator	54065	3

رواد مصر الرقمية

وزارة الاتصالات
وتكنولوجيا المعلومات

Data Cleaning

a- Handling missing values.

- There are 7,800 missing values in the “Termdate" column, and they have been replaced.

```
HR.isna().sum()
```

✓ 0.0s

```
Employee_ID                0
First Name                 0
Last Name                  0
Gender                     0
State                      0
City                       0
Education Level            0
Birthdate                  0
Hiredate                   0
Termdate                7800
Department                 0
Job Title                  0
Salary                     0
Performance Rating         0
dtype: int64
```

```
# Replacing nulls in termdate with Still Employee
HR['Termdate']= HR['Termdate'].fillna('Still Employee')
```

✓ 0.0s

b-The column formats were converted to the appropriate format.

```
#function to convert to time and leave values as they are
def convert_date(value):
    try:
        date = pd.to_datetime(value, format='%d/%m/%Y', errors='raise')
        return date.date()
    except ValueError:
        return value
```

✓ 0.0s

```
#changing data types to date
HR['Birthdate'] = pd.to_datetime(HR['Birthdate'], format='%d/%m/%Y')
HR['Hiredate'] = pd.to_datetime(HR['Hiredate'])
HR['Termdate'] = HR['Termdate'].apply(convert_date)
```

✓ 0.3s

c- Handling duplicates.

- There Are No duplicates in data .

```
#check for duplicate
HR.duplicated().sum()
```

✓ 0.0s Python

```
0
```

d-Replacing Values

The values 0, 1, 2, etc., were replaced with appropriate labels for each column.

```
#replacing values of gender
HR['Gender'] = HR['Gender'].replace({
    1: 'Male',
    0: 'Female'
    })

HR.head()
```

✓ 0.0s

	Employee_ID	First Name	Last Name	Gender	State	City	Education Level	Birthdate	Hiredate
0	00-95822412	Danielle	Johnson	Female	New York	New York City	High School	1980-02-13	2016-04-16
1	00-42868828	John	Taylor	Male	North Carolina	Charlotte	Bachelor	1987-09-22	2017-02-09
2	00-83197857	Erica	Mcclain	Male	New York	New York City	Bachelor	1994-05-19	2016-02-03
3	00-13999315	Brittany	Johnson	Male	New York	New York City	Bachelor	1980-04-18	2016-02-06
4	00-90801586	Jeffery	Wagner	Female	New York	New York City	Bachelor	1985-04-07	2015-01-11

```
#replacing value of Performance Rating
HR['Performance Rating'] = HR['Performance Rating'].replace({
    1 : 'Need Improvement',
    2 : 'Satisfactory',
    3 : 'Good',
    4 : 'Excellent'
    })

HR.head()
```

✓ 0.0s Python

Last Name	Gender	State	City	Education Level	Birthdate	Hiredate	Termdate	Department	Job Title	Salary	Performance Rating
Johnson	Female	New York	New York City	High School	1980-02-13	2016-04-16	2021-07-05	Customer Service	Help Desk Technician	81552	Need Improvement
Taylor	Male	North Carolina	Charlotte	Bachelor	1987-09-22	2017-02-09	2019-06-14	IT	System Administrator	107520	Good
Mcclain	Male	New York	New York City	Bachelor	1994-05-19	2016-02-03	2021-03-06	Operations	Logistics Coordinator	61104	Good
Johnson	Male	New York	New York City	Bachelor	1980-04-18	2016-02-06	2018-11-06	Operations	Inventory Specialist	73770	Good
Wagner	Female	New York	New York City	Bachelor	1985-04-07	2015-01-11	Still Employee	Operations	Operations Analyst	55581	Satisfactory

Add new Columns to Data

```
# creat column 'fullname' and remove 'first name' and 'last name'
#creat column and make it the second column
HR['Full Name'] = HR['First Name'] + ' ' + HR['Last Name']
HR.insert(1, 'Full Name', HR.pop('Full Name'))
#remove columns
HR = HR.drop(['First Name', 'Last Name'], axis=1)
#show results
HR.head()
```

✓ 0.0s

	Employee_ID	Full Name	Gender	State	City	Education Level	Birthdate	Hiredate	Termdate	Dep
0	00-95822412	Danielle Johnson	Female	New York	New York City	High School	1980-02-13	2016-04-16	2021-07-05	
1	00-42868828	John Taylor	Male	North Carolina	Charlotte	Bachelor	1987-09-22	2017-02-09	2019-06-14	
2	00-83197857	Erica Mcclain	Male	New York	New York City	Bachelor	1994-05-19	2016-02-03	2021-03-06	O
3	00-13999315	Brittany Johnson	Male	New York	New York City	Bachelor	1980-04-18	2016-02-06	2018-11-06	O
4	00-90801586	Jeffery Wagner	Female	New York	New York City	Bachelor	1985-04-07	2015-01-11	Still Employee	O

```
# Define today's date
Current_Date = pd.to_datetime(datetime.today().date())

# Add the age Column
HR['Age'] = ( Current_Date - HR['Birthdate']).dt.days // 365
HR.insert(7, 'Age', HR.pop('Age'))

HR.head()
```

✓ 0.0s

	Employee_ID	Full Name	Gender	State	City	Education Level	Birthdate	Age	Hiredate	Termdate
0	00-95822412	Danielle Johnson	Female	New York	New York City	High School	1980-02-13	44	2016-04-16	2021-07-05
1	00-42868828	John Taylor	Male	North Carolina	Charlotte	Bachelor	1987-09-22	37	2017-02-09	2019-06-14
2	00-83197857	Erica Mcclain	Male	New York	New York City	Bachelor	1994-05-19	30	2016-02-03	2021-03-06
3	00-13999315	Brittany Johnson	Male	New York	New York City	Bachelor	1980-04-18	44	2016-02-06	2018-11-06
4	00-90801586	Jeffery Wagner	Female	New York	New York City	Bachelor	1985-04-07	39	2015-01-11	Still Employee

```
# Create a new column 'Employee Status' based on column 'Termdate'

HR['Employee Status'] = HR['Termdate'].apply(lambda x: 'Active' if x=='Still Employee' else 'Termi
HR.insert(11, 'Employee Status', HR.pop('Employee Status'))

HR.head()
```

✓ 0.0s

ender	State	City	Education Level	Birthdate	Age	Hiredate	Termdate	Years of Service	Employee Status	Department
emale	New York	New York City	High School	1980-02-13	44	2016-04-16	2021-07-05	5	Terminated	Customer Service
Male	North Carolina	Charlotte	Bachelor	1987-09-22	37	2017-02-09	2019-06-14	2	Terminated	IT
Male	New York	New York City	Bachelor	1994-05-19	30	2016-02-03	2021-03-06	5	Terminated	Operations
Male	New York	New York City	Bachelor	1980-04-18	44	2016-02-06	2018-11-06	2	Terminated	Operations
emale	New York	New York City	Bachelor	1985-04-07	39	2015-01-11	Still Employee	9	Active	Operations

```
# Create a new column 'Jop Level' based on 'jop title'
 # Function to determine job level
def classify_job(title):
    if 'Manager' in title:
        return 'Manager'
    elif title in ['Financial Analyst', 'Operations Analyst', 'SEO Specialist', 'Software Developer']:
        return 'Senior'
    elif title in ['System Administrator', 'Logistics Coordinator', 'Inventory Specialist','Accountant',
                   'Accounts Payable Specialist', 'Recruiter', 'IT Support Specialist', 'Sales Specialist',
                   'Sales Consultant', 'Content Creator', 'HR Coordinator', 'Marketing Coordinator']:
        return 'Mid-Level'
    elif title in ['Help Desk Technician', 'Customer Service Representative', 'Support Specialist',
                    'Sales Representative','HR Assistant']:
        return 'Junior'
    else:
        return 'Unknown'
```

✓ 0.0s

```
HR['Jop Level'] = HR['Job Title'].apply(classify_job)
HR.insert(14, 'Jop Level', HR.pop('Jop Level'))

HR.head()
```

✓ 0.0s

ty	Education Level	Birthdate	Age	Hiredate	Termdate	Years of Service	Employee Status	Department	Job Title	Jop Level	Salary	Perf
w ty	High School	1980-02-13	44	2016-04-16	2021-07-05	5	Terminated	Customer Service	Help Desk Technician	Junior	81552	Impr
te	Bachelor	1987-09-22	37	2017-02-09	2019-06-14	2	Terminated	IT	System Administrator	Mid-Level	107520	
w	Bachelor	1994-05-	30	2016-02-	2021-03-	5	Terminated	Operations	Logistics	Mid-	61104	

Answering the questions using SQL.

```sql
--Calculate Overall Average Salary
select avg(salary) as "Average Salary"
from employees ;
```

Results | Messages

Average Salary
70971.9897330595

```sql
--Average Salary by Gender:
SELECT Gender , AVG(Salary) AS Avg_Salary
FROM employees
GROUP BY Gender;
```

Results | Messages

	Gender	Avg_Salary
1	Male	72569.8015704584
2	Female	69114.838924519

```sql
-- What is the average salary for each performance rating (Average Salary by Performance Rating)?
SELECT Performance_Rating, AVG(Salary) AS Average_Salary
FROM employees
GROUP BY Performance_Rating;
```

Results | Messages

Performance_Rating	Average_Salary
Good	71514.5850746269
Satisfactory	69772.0801308258
Excellent	74412.3949086162
Need Improvement	67041.6310063463

```sql
--How many employees have a performance rating of 'Excellent' and earn above the average salary?
SELECT COUNT(Employee_ID) AS Excellent_Above_Avg_Salary
FROM employees
WHERE Performance_Rating = 'Excellent'
AND Salary > (SELECT AVG(Salary) FROM employees);
```

110 %

Results | Messages

	Excellent_Above_Avg_Salary
1	753

```sql
--What is the average salary for employees with excellent performance ratings?
SELECT AVG(Salary) AS Avg_Salary
FROM employees
WHERE Performance_Rating = 'Excellent';
```

110 %

Results | Messages

	Avg_Salary
1	74412.3949086162

```sql
--What is the average salary for employees with more than 5 years of service?
SELECT AVG(Salary) AS Avg_Salary
FROM employees
WHERE Years_of_Service > 5;
```

110 %

Results | Messages

	Avg_Salary
1	70891.7183513248

```sql
--What is the average salary by job level?(Salary Distribution by Job Level)
SELECT Job_Level, AVG(Salary) AS Avg_Salary
FROM employees
GROUP BY Job_Level;
```

110 %

Results | Messages

	Job_Level	Avg_Salary
1	Mid-Level	68154.8824404762
2	Senior	83084.6924110141
3	Manager	97360.2979591837
4	Junior Level	66139.8260309278

```sql
--How many employees are there in each department?
SELECT Department, COUNT(*) AS Number_of_Employees
FROM employees
GROUP BY Department;
```

110 %

Results | Messages

	Department	Number_of_Employees
1	Finance	444
2	Operations	2668
3	Sales	1805
4	Marketing	702
5	HR	164
6	Customer Service	1640
7	IT	1343

```sql
--Average Salary by Department:
SELECT Department , AVG(Salary) AS Avg_Salary
FROM employees
GROUP BY Department;
```

110 %

Results | Messages

	Department	Avg_Salary
1	Finance	76548.8130630631
2	Operations	65435.4970014993
3	Sales	76148.1789473684
4	Marketing	67611.0982905983
5	HR	64099.2073170732
6	Customer Service	65892.1097560976
7	IT	81969.5450483991

```sql
--What is the gender distribution in each department?
SELECT Department,
       Gender,
       COUNT(Employee_ID) AS Number_of_Employees
FROM employees
GROUP BY Department , Gender
ORDER BY Department;
```

110 %

Results | Messages

	Department	Gender	Number_of_Employees
1	Customer Service	Female	759
2	Customer Service	Male	881
3	Finance	Female	208
4	Finance	Male	236
5	HR	Female	91
6	HR	Male	73
7	IT	Female	582
8	IT	Male	761
9	Marketing	Female	343
10	Marketing	Male	359
11	Operations	Female	1226
12	Operations	Male	1442
13	Sales	Male	960
14	Sales	Female	845

```sql
--What is the gender distribution across the company?
SELECT Gender, COUNT(*) AS Number_of_Employees
FROM employees
GROUP BY Gender;
```

110 %

Results | Messages

	Gender	Number_of_Employees
1	Male	4712
2	Female	4054

```sql
--What is the average number of years of service by department? (Average Years of Service by Department) :
SELECT Department, AVG(Years_of_Service) AS Avg_Years_of_Service
FROM employees
GROUP BY Department;
```

110 %

Results | Messages

	Department	Avg_Years_of_Service
1	Finance	3
2	Operations	3
3	Sales	3
4	Marketing	3
5	HR	3
6	Customer Service	3
7	IT	3

```sql
--What is the average age of employees in each department? (Average Age by Department):
SELECT Department, AVG(Age) AS Avg_Age
FROM employees
GROUP BY Department;
```

110 %

Results | Messages

	Department	Avg_Age
1	Finance	40
2	Operations	39
3	Sales	41
4	Marketing	40
5	HR	39
6	Customer Service	40
7	IT	39

```sql
--Employee Distribution by Job Level:
SELECT Job_Level,
       COUNT(Employee_ID) AS Number_of_Employees
FROM employees
GROUP BY Job_Level;
```

110 %

Results | Messages

	Job_Level	Number_of_Employees
1	Mid-Level	4704
2	Senior	1489
3	Manager	245
4	Junior Level	2328

```sql
--What is the average performance rating by department?
SELECT Department,
       AVG(CASE
           WHEN Performance_Rating = 'Excellent' THEN 4
           WHEN Performance_Rating = 'Good' THEN 3
           WHEN Performance_Rating = 'Satisfactory' THEN 2
           WHEN Performance_Rating = 'Need Improve' THEN 1
           ELSE 0
       END) AS Avg_Performance_Score
FROM employees
GROUP BY Department;
```

110 %

Results | Messages

	Department	Avg_Performance_Score
1	Finance	2
2	Operations	2
3	Sales	2
4	Marketing	2
5	HR	2
6	Customer Service	2
7	IT	2

```sql
--What is the percentage of employees in each state?
SELECT State, COUNT(*) * 100.0 / (SELECT COUNT(*) FROM employees) AS Percentage_of_Employees
FROM employees
GROUP BY State
ORDER BY State;
```

110 %

Results | Messages

	State	Percentage_of_Employees
1	Illinois	3.205566963267
2	Michigan	10.985626283367
3	New York	69.986310746064
4	North Carolina	4.791238877481
5	Ohio	3.011635865845
6	Pennsylvania	4.882500570385
7	Virginia	1.973534109057
8	West Virginia	1.163586584531

```sql
--How many employees have been hired in the last three years?
SELECT COUNT(*) AS Number_of_Employees_Hired
FROM employees
WHERE Hiredate >= DATEADD(YEAR, -3, GETDATE());
```

110 %

Results | Messages

	Number_of_Employees_Hired
1	2948

```sql
--How many employees are terminated within their first year of service?
SELECT COUNT(Employee_ID) AS Terminated_In_First_Year
FROM employees
WHERE DATEDIFF(YEAR, Hiredate , Termdate) <= 1
AND Employee_Status = 'Terminated';
```

110 %

Results | Messages

	Terminated_In_First_Year
1	597

```sql
--How many employees are close to retirement? (Number of Employees Near Retirement)(age > 60):
SELECT COUNT(*) AS Near_Retirement
FROM employees
WHERE Age > 60;
```

110 %

Results | Messages

	Near_Retirement
1	458

```sql
--Percentage of Employees Near Retirement (age > 60):
SELECT
    (SELECT COUNT(*) FROM employees WHERE Age > 60) * 100.0 /
    (SELECT COUNT(*) FROM employees) AS Near_Retirement_Percentage;
```

110 %

Results | Messages

	Near_Retirement_Percentage
1	5.224731918777

```sql
--How many employees have been terminated over all ? ( turnover rate)
SELECT (SELECT COUNT(*) FROM employees WHERE Employee_Status = 'Terminated') * 100.0 / (SELECT COUNT(*) FROM employees) AS Turnover_Rate ;
```

110 %

Results | Messages

	Turnover_Rate
1	11.019849418206

```sql
--Turnover Rate by Year:
SELECT  YEAR(Hiredate) AS Year,COUNT(CASE WHEN Employee_Status = 'Terminated' THEN 1 END) AS Terminated_Count,
COUNT(*) AS Total_Employees, COUNT(CASE WHEN Employee_Status = 'Terminated' THEN 1 END) * 100.0 / COUNT(*) AS Turnover_Rate
FROM employees
GROUP BY YEAR(Hiredate)
ORDER BY Year;
```

110 %

Results | Messages

	Year	Terminated_Count	Total_Employees	Turnover_Rate
1	2015	42	472	8.898305084745
2	2016	76	729	10.425240054869
3	2017	205	1560	13.141025641025
4	2018	141	850	16.588235294117
5	2019	98	902	10.864745011086
6	2020	110	968	11.363636363636
7	2021	40	422	9.478672985781
8	2022	135	1042	12.955854126679
9	2023	67	1201	5.578684429641
10	2024	52	620	8.387096774193

```sql
--What are the most influential factors affecting turnover rates?
SELECT Employee_Status,
       AVG(Salary) AS Avg_Salary,
       AVG(Age) AS Avg_Age,
       AVG(Years_of_Service) AS Avg_Years_of_Service
FROM employees
GROUP BY Employee_Status;
```

110 %

Results | Messages

	Employee_Status	Avg_Salary	Avg_Age	Avg_Years_of_Service
1	Active	70959.2423076923	40	4
2	Terminated	71074.9192546584	40	1

```sql
--What is the percentage of employees by performance rating? (Performance Rating Distribution) :
SELECT Performance_Rating,
       COUNT(Employee_ID) * 100.0 / (SELECT COUNT(*) FROM employees) AS Percentage_of_Employees
FROM employees
GROUP BY Performance_Rating;
```

110 %

Results | Messages

	Performance_Rating	Percentage_of_Employees
1	Good	42.037417294090
2	Satisfactory	27.903262605521
3	Excellent	17.476614191193
4	Need Improvement	12.582705909194

```sql
--What is the percentage of employees by gender in each performance rating?
SELECT  Gender, Performance_Rating, COUNT(*) * 100.0 / (SELECT COUNT(*) FROM employees) AS Percentage_of_Employees
FROM employees
GROUP BY Gender, Performance_Rating
ORDER BY Gender , CASE Performance_Rating
             WHEN 'Excellent' THEN 1
             WHEN 'Good' THEN 2
             WHEN 'Satisfactory' THEN 3
             WHEN 'Need Improvement' THEN 4
             ELSE 5
         END;
```

110 %

Results | Messages

	Gender	Performance_Rating	Percentage_of_Employees
1	Female	Excellent	8.065252110426
2	Female	Good	19.438740588637
3	Female	Satisfactory	12.673967602099
4	Female	Need Improvement	6.068902578142
5	Male	Excellent	9.411362080766
6	Male	Good	22.598676705452
7	Male	Satisfactory	15.229295003422
8	Male	Need Improvement	6.513803331051

```sql
--How does education level affect salaries?
SELECT Education_Level, AVG(Salary) AS Average_Salary
FROM employees
GROUP BY Education_Level;
```

110 %

Results | Messages

	Education_Level	Average_Salary
1	Master	82614.1158940397
2	High School	62179.8318284424
3	PhD	86032.0233545648
4	Bachelor	69922.6462841016

```sql
--What is the distribution of employees' education levels?
SELECT Education_Level,
       COUNT(*) AS Number_of_Employees
FROM employees
GROUP BY Education_Level;
```

110 %

Results | Messages

	Education_Level	Number_of_Employees
1	Master	1208
2	High School	1772
3	PhD	471
4	Bachelor	5315

```sql
--How can we predict future performance based on current data?
SELECT Performance_Rating,
       AVG(Salary) AS Avg_Salary,
       AVG(Years_of_Service) AS Avg_Years_of_Service,
       AVG(Age) AS Avg_Age
FROM employees
GROUP BY Performance_Rating;
```

110 %

Results | Messages

	Performance_Rating	Avg_Salary	Avg_Years_of_Service	Avg_Age
1	Good	71514.5850746269	3	40
2	Satisfactory	69772.0801308258	3	40
3	Excellent	74412.3949086162	3	40
4	Need Improvement	67041.6310063463	3	39

Answer Questions Using Python

An analysis of employee turnover, salary distribution, and promotions

Introduction

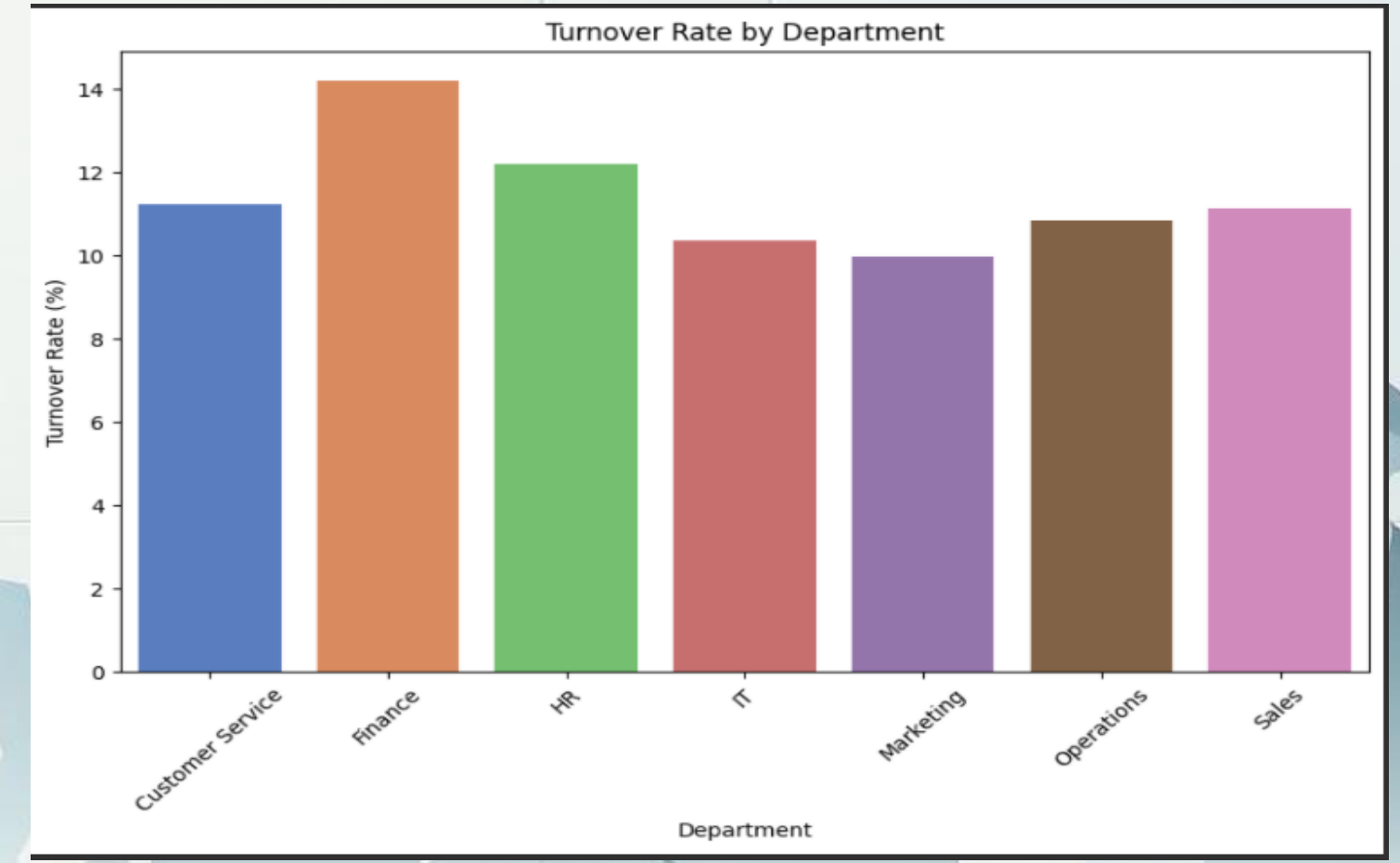
- This report analyzes an HR dataset that includes key information about employees, such as their demographics, job roles, salaries, and turnover status. The objective of the analysis is to provide insights into patterns affecting employee retention, salary distribution, and promotion practices.

Turnover Analysis

- Turnover is a critical HR metric. High turnover can be costly for organizations in terms of recruitment, training, and productivity loss. The turnover rate was analyzed by department.

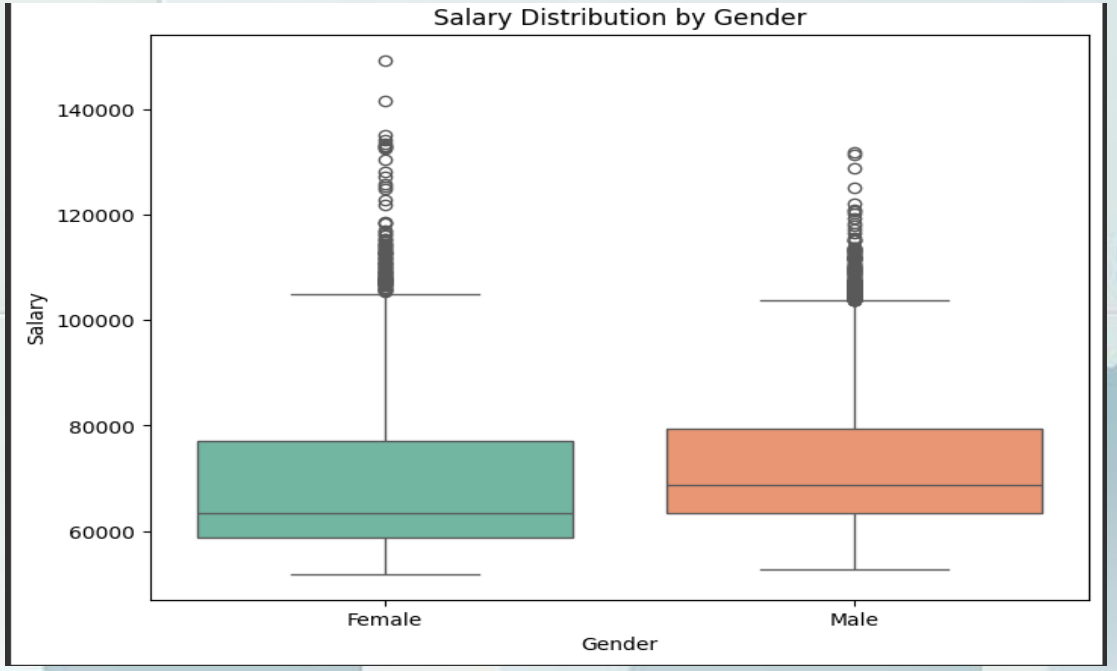
Turnover Rate by Department

- Sales and HR departments exhibit the highest turnover rates.
- Research & Development and Marketing have lower turnover rates.



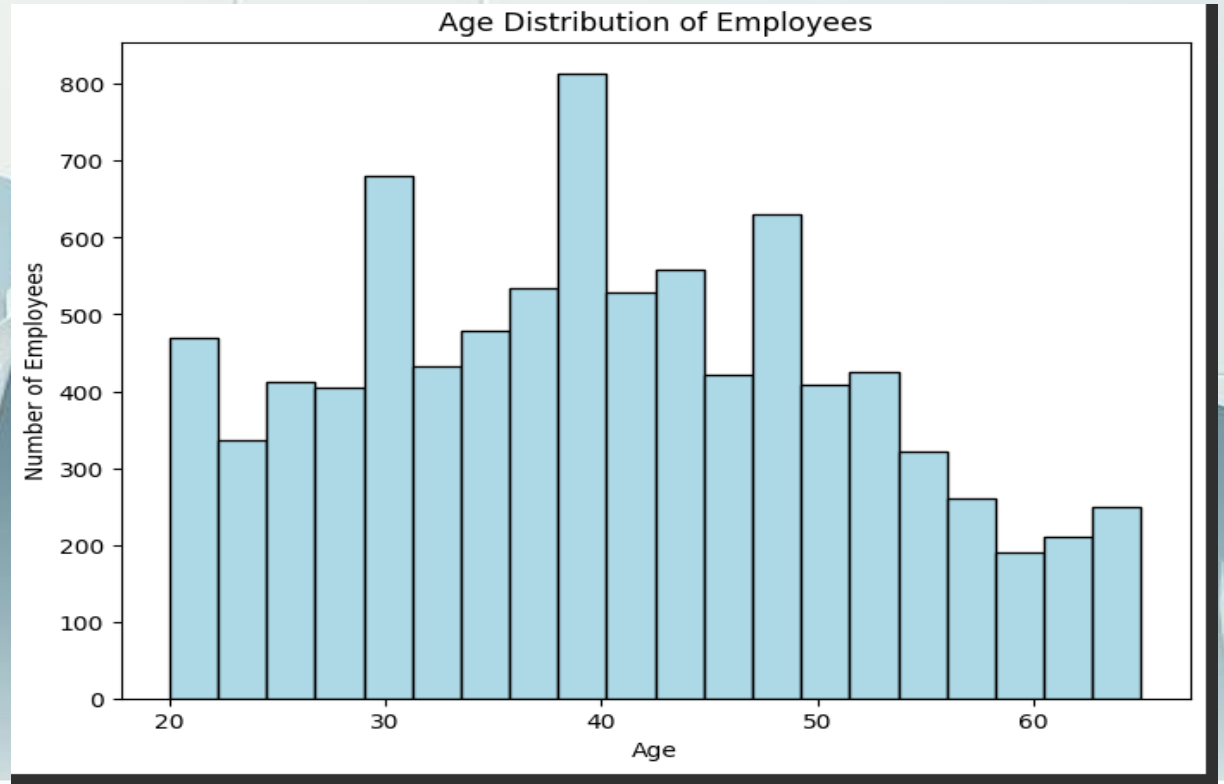
Salary Distribution Analysis

- Salary distribution was analyzed by Gender:
- - Some roles show wide variability in salaries (e.g., Females, Males).
- - Salary disparities should be addressed, particularly for roles like HR Representatives.



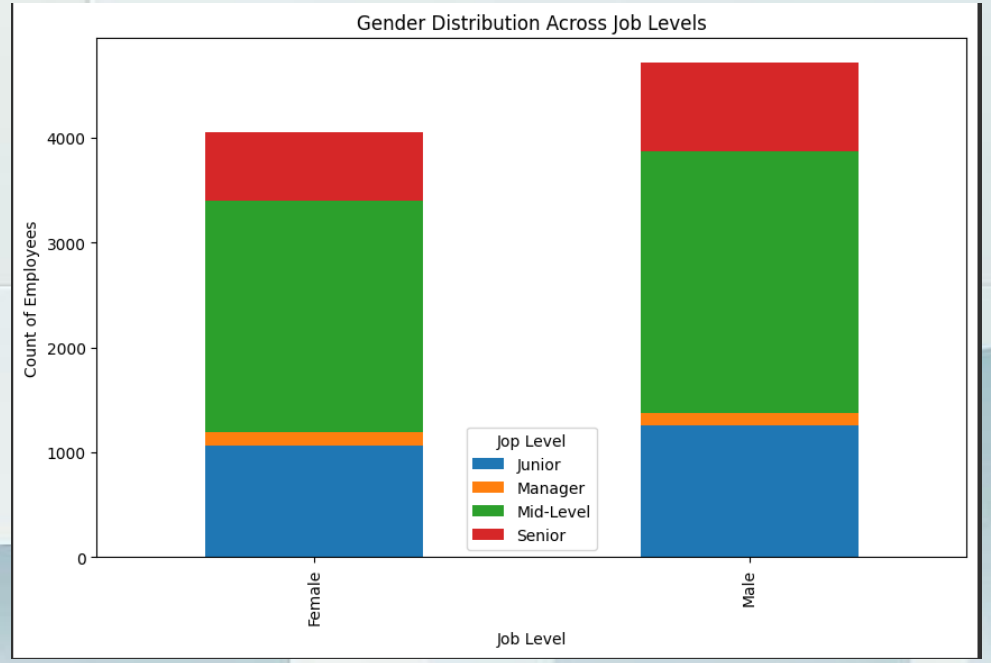
Age Distribution of Employees

- The majority of employees is more than 30.
- The lowest number of employees is mor then 50.



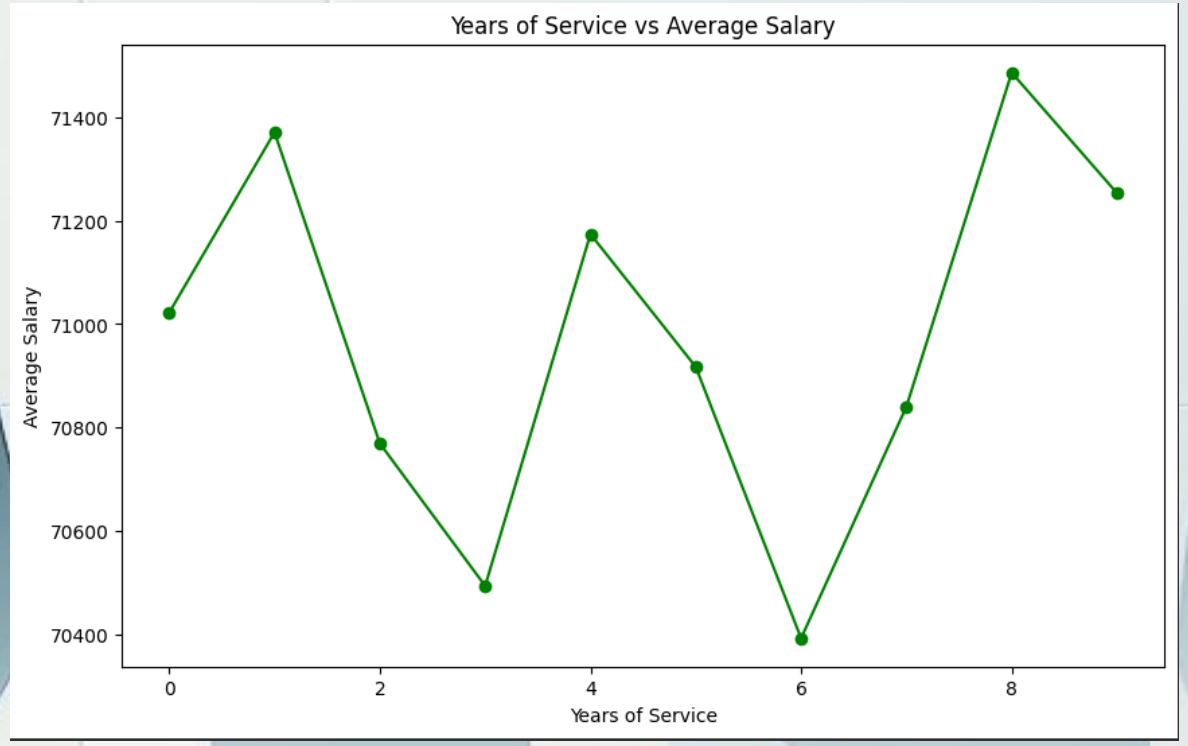
Gender Distribution across job levels

- Highest number of employees is the mid-level.
- Lowest number of employees is the managers level.



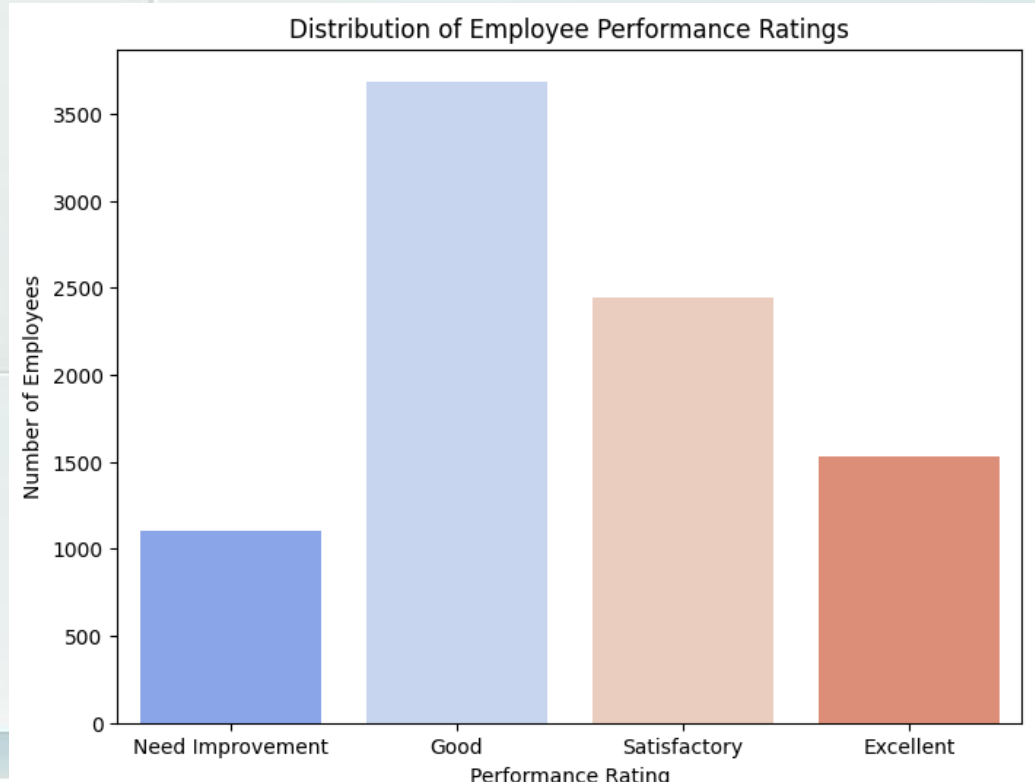
Years of Service Vs. Average Salary

- Highest years of service (more than 8 years) is the most paid employee.
- Lowest paid employee is with 6 years of service.



Distribution of Employees based on Performance Rating

- Highest number of employees is the employees with good performance rating.
- Lowest number of employees is employees the need improvement.

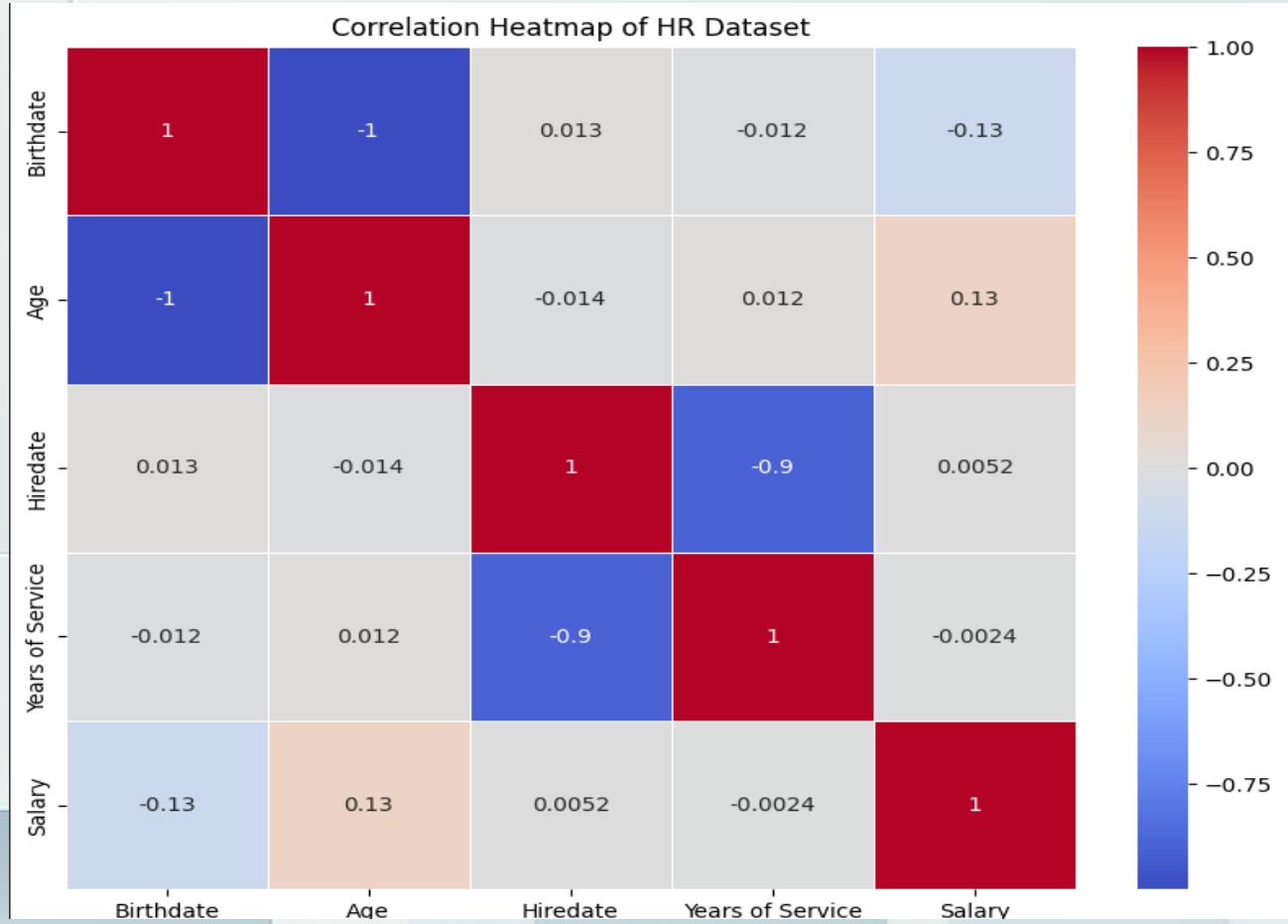


Salaries by Years of Service and Gender

- Males have the higher paid average more than females.
- The more years of service the higher the paid average.

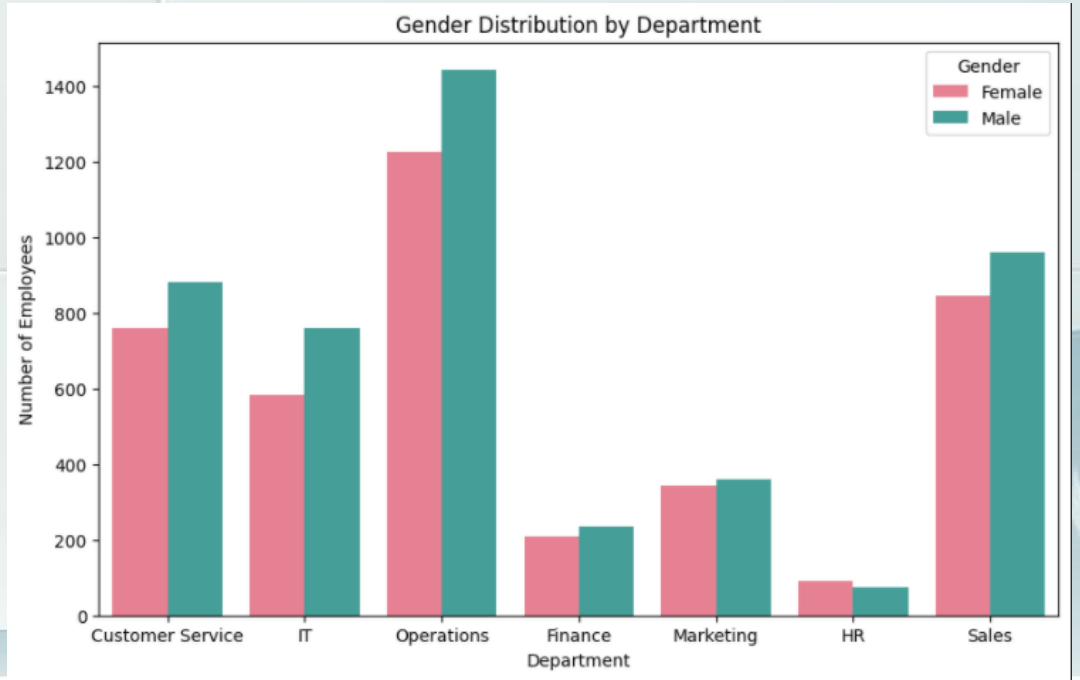
Correlation Heatmap for the Dataset

1.Correlation between Birthday and Salary: The correlation coefficient of -0.13 indicates a weak negative relationship between birthday and salary. This suggests that there is not a significant impact of birthday on salary levels.
2.Correlation between Birthday and Years of Service: The correlation coefficient of -0.012 reflects a lack of a clear relationship between birthday and years of service, indicating that the age of an employee when they start working does not significantly affect their length of service.
3.Correlation between Birthday and Hire Date: The correlation coefficient of -0.013 indicates that there is no significant correlation between birthday and hire date.
4.Correlation between Birthday and Age: The correlation coefficient of -1 indicates a perfect negative relationship, which is expected since birthday and age are directly related. This means that this correlation can be anticipated.
5.Correlation between Age and Salary: A correlation coefficient of 0.13 suggests a weak positive relationship between age and salary. This indicates that as an employee's age increases, their salary may also increase, but the effect is not strong.
6.Correlation between Age and Years of Service: A correlation coefficient of 0.012 indicates no significant relationship between age and years of service.
7.Correlation between Age and Hire Date: The correlation coefficient of -0.014 shows a lack of significant correlation between age and hire date.
8.Correlation between Hire Date and Salary: The correlation coefficient of 0.0052 indicates no clear relationship between hire date and salary.
9.Correlation between Hire Date and Years of Service: A correlation coefficient of -0.9 suggests a strong negative relationship between hire date and years of service, meaning that as the hire date increases, years of service may decrease. This may indicate frequent hiring or job changes.
10.Correlation between Years of Service and Salary: The correlation coefficient of -0.0024 suggests no notable relationship between years of service and salary.



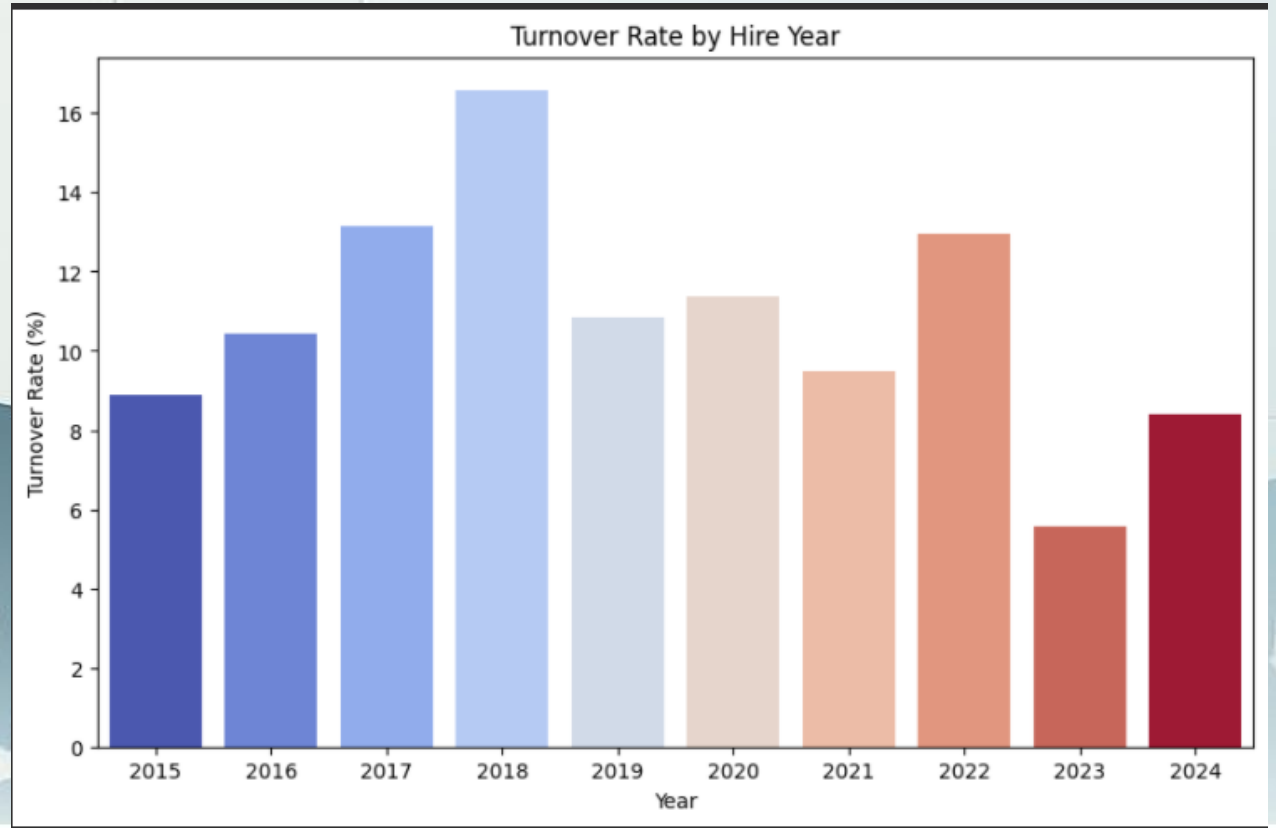
Gender Distribution by Department

- Number of male employees in the operations, sales, customer service have the highest rate more than females.
- Females have the highest rate in HR department.



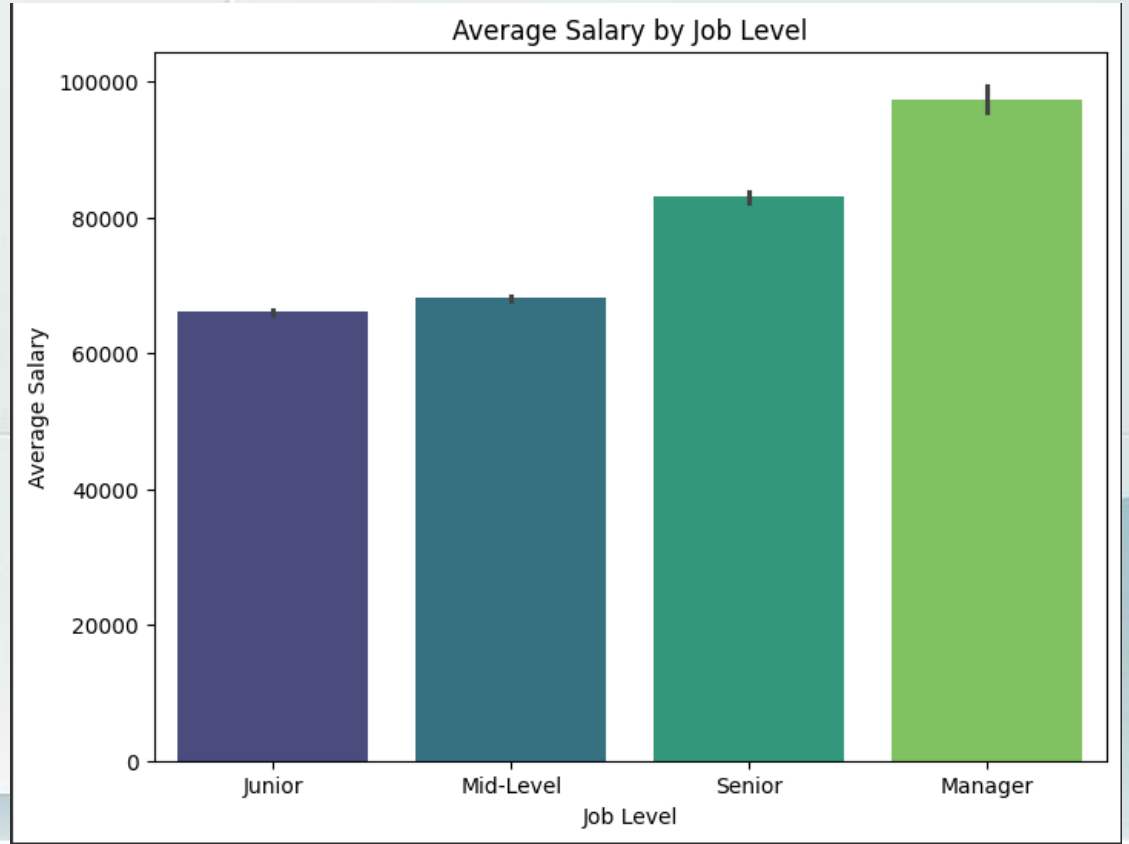
Turnover rate by Hire Year

- 2017 has the most turnover percentage with 16%.



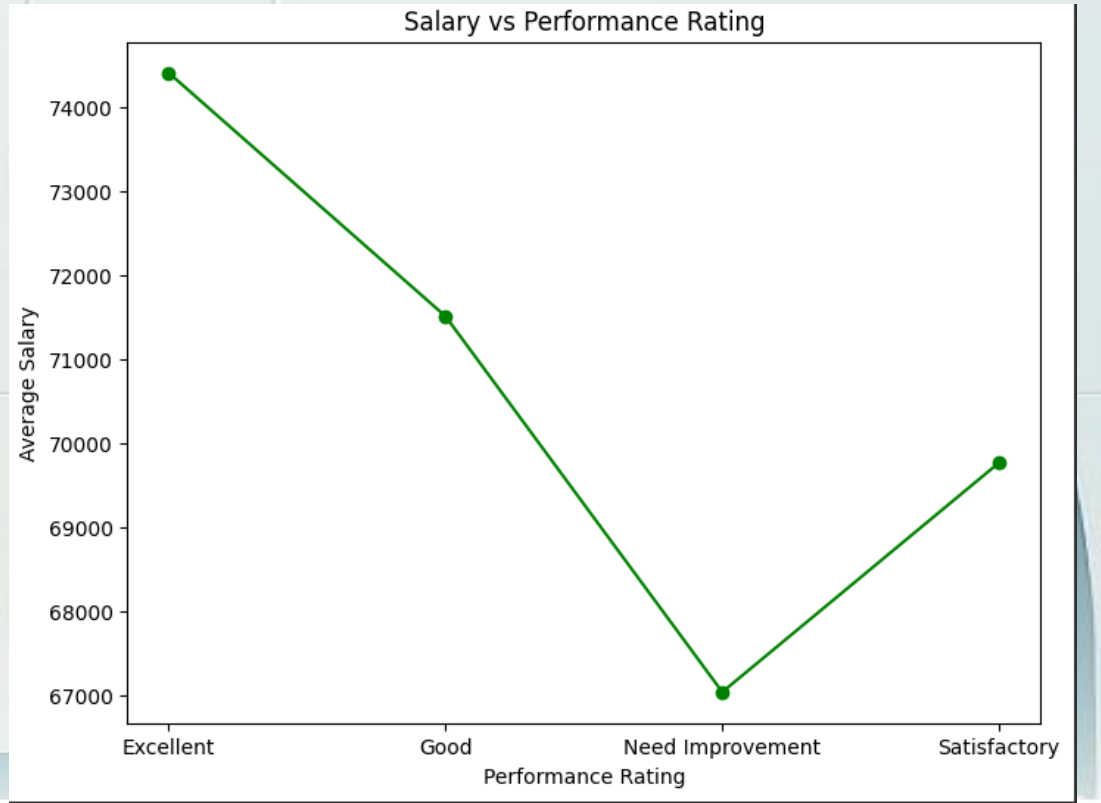
Average Salary by job Level

- The highest salary is the manager level.
- The lowest salary is the junior level.

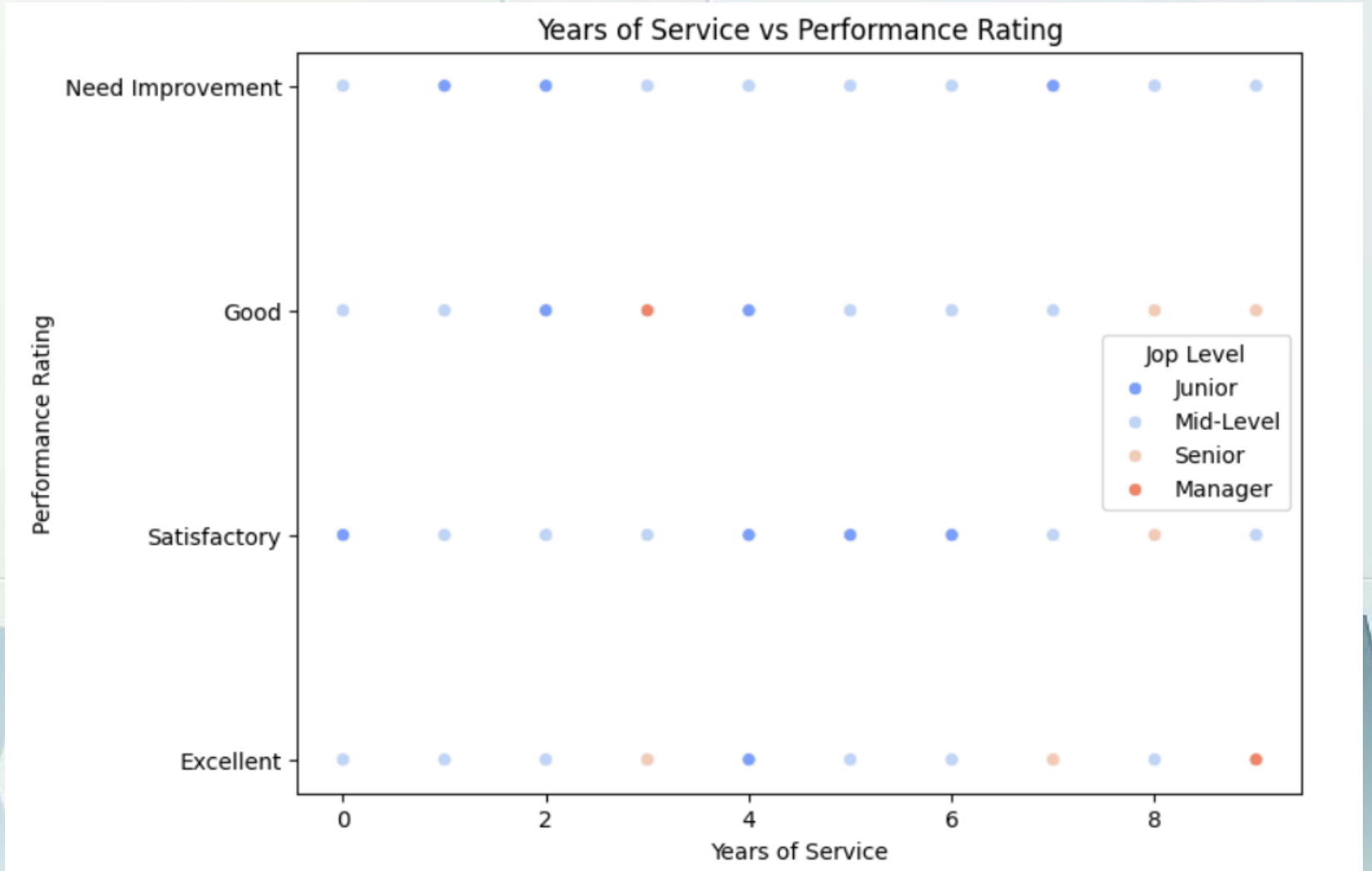


Salary Vs. Performance Rating

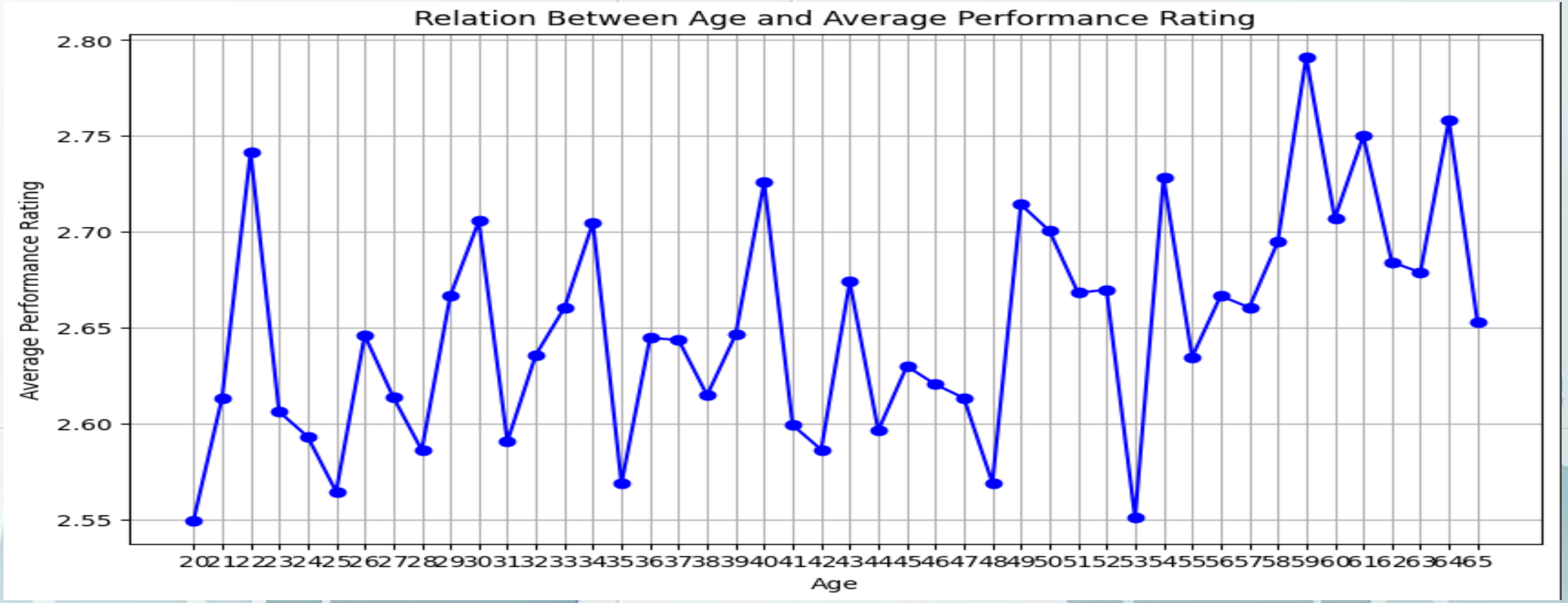
- Employees with excellent performance are the highest paid salary.
- Employees who need improvement have the lowest salary.



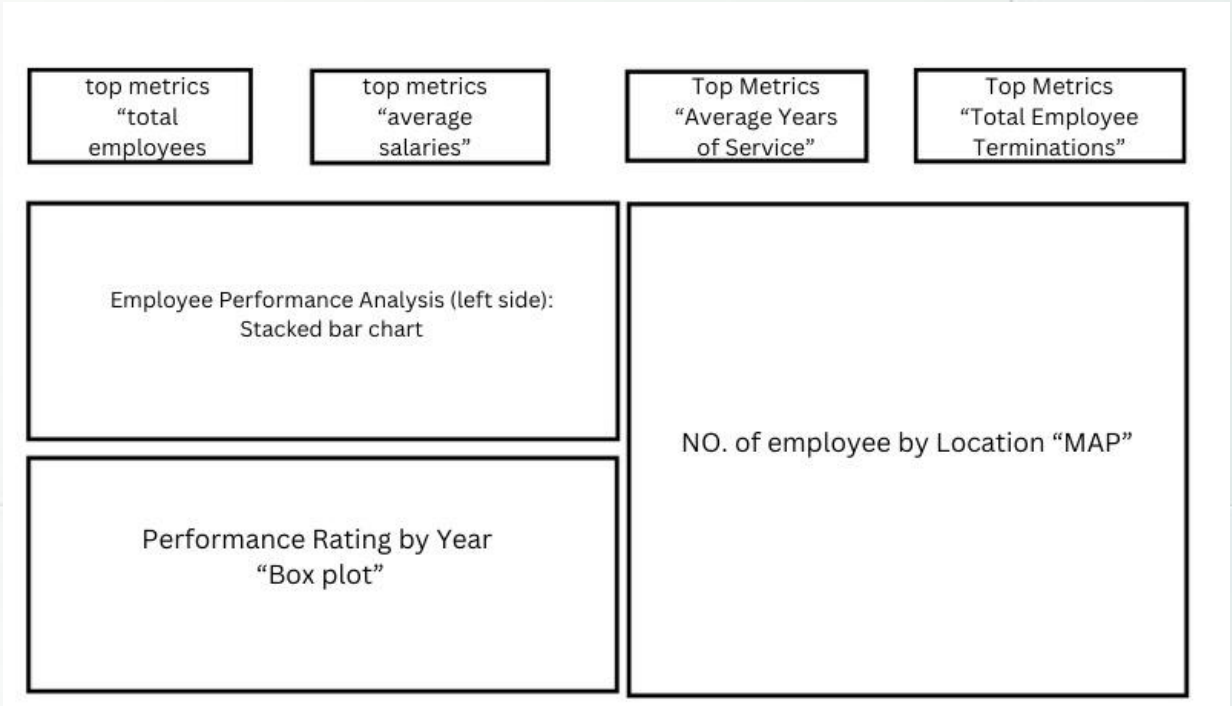
Years of Service Vs. Performance Rating

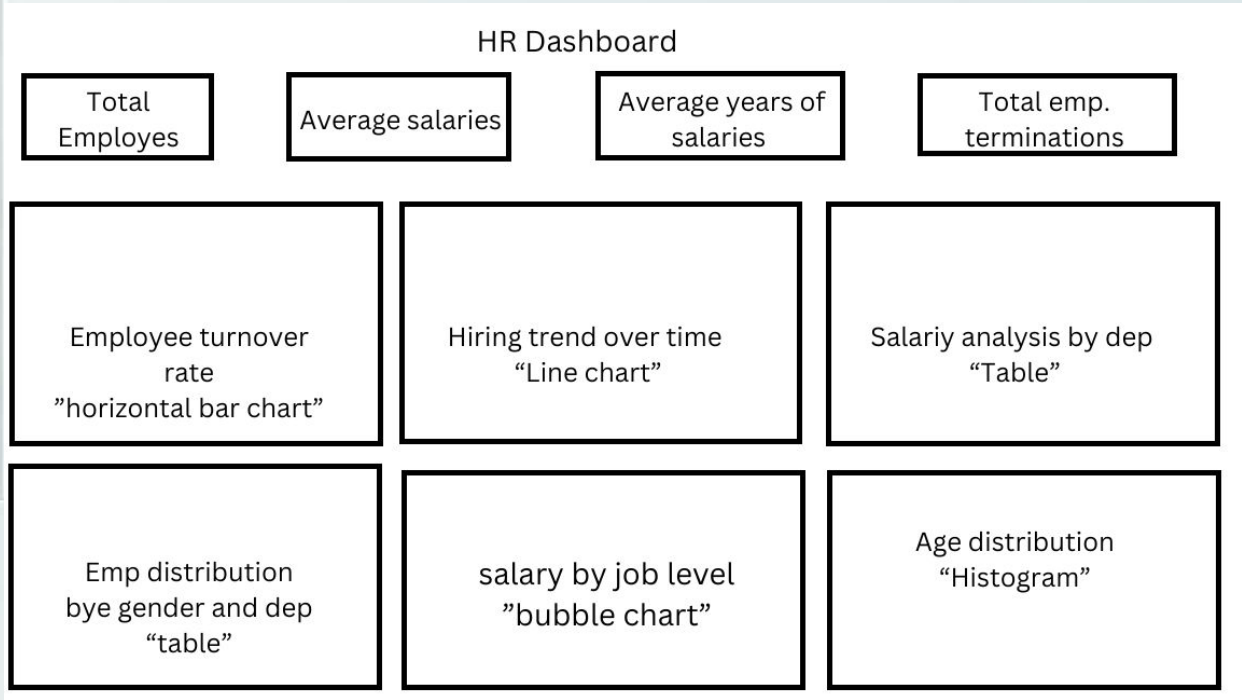


Relation Between Age and Average Performance Rating



blueprint


top metrics "total employees
top metrics "average salaries"
Top Metrics "Average Years of Service"
Top Metrics "Total Employee Terminations"
Employee Performance Analysis (left side): Stacked bar chart
NO. of employee by Location "MAP"
Performance Rating by Year "Box plot"


HR Dashboard
Total Employes
Average salaries
Average years of salaries
Total emp. terminations
Employee turnover rate "horizontal bar chart"
Hiring trend over time "Line chart"
Salariy analysis by dep "Table"
Emp distribution bye gender and dep "table"
salary by job level "bubble chart"
Age distribution "Histogram"

رواد مصر الرقمية

وزارة الاتصالات وتكنولوجيا المعلومات

HR Tableau REPORT

Dashboard 1

Hr Dashboard

Gender (All) Employe.. (All)

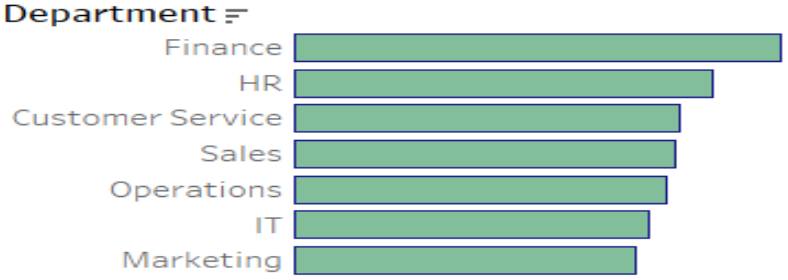
Total Employees
8,766

Average Salary
71K

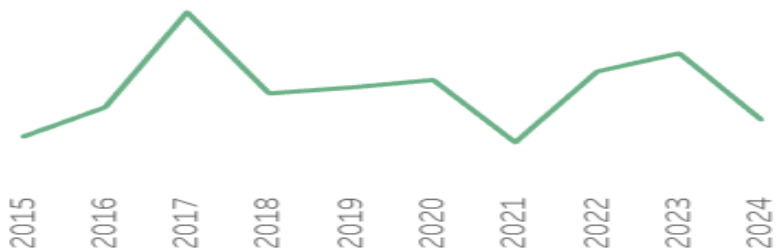
Average Years of Service
4

Total Employee Terminations
966

Employee Turnover Rate



Hiring Trend Over Time



Salary Analysis by Department

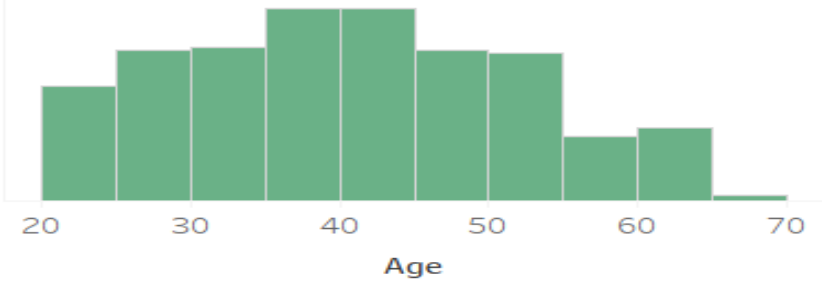
Department	
IT	81,970
Finance	76,549
Sales	76,148
Marketing	67,611
Customer Service	65,892
Operations	65,435
HR	64,099

Employee Distribution by Gender and Department

Department	Female	Male	Grand T..
Operations	1,226	1,442	2,668
Sales	845	960	1,805
Customer Service	759	881	1,640
IT	582	761	1,343
Marketing	343	359	702
Finance	208	236	444
HR	91	73	164
Grand Total	4,054	4,712	8,766

Job Level Salary Comparison

Age Distribution



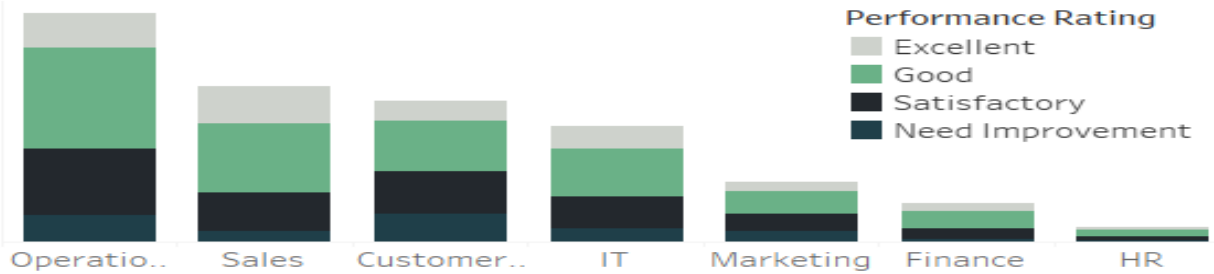
Dashboard 2

Perofrmance Hr Dashboard

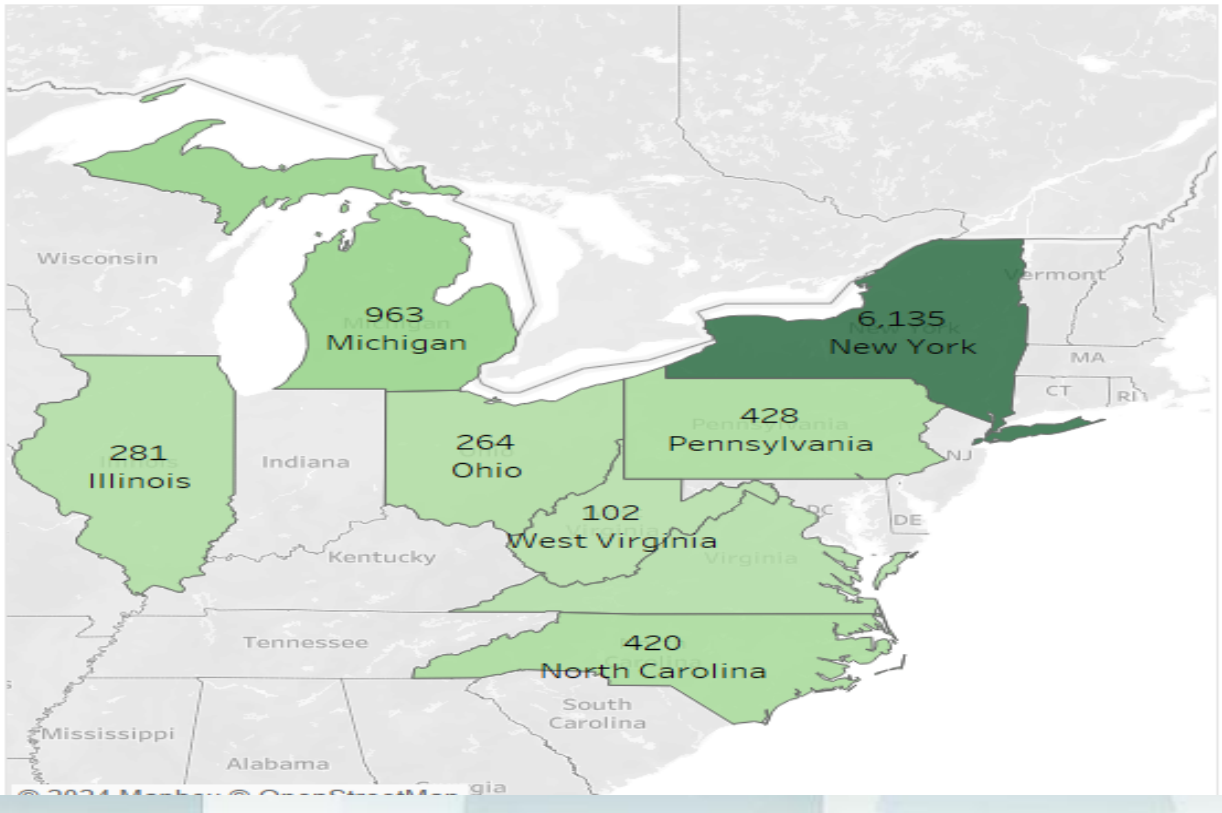
Gender (All) Employe.. (All)

Total Employees	Average Salary	Average Years of Service	Total Employee Terminations
8,766	71K	4	966

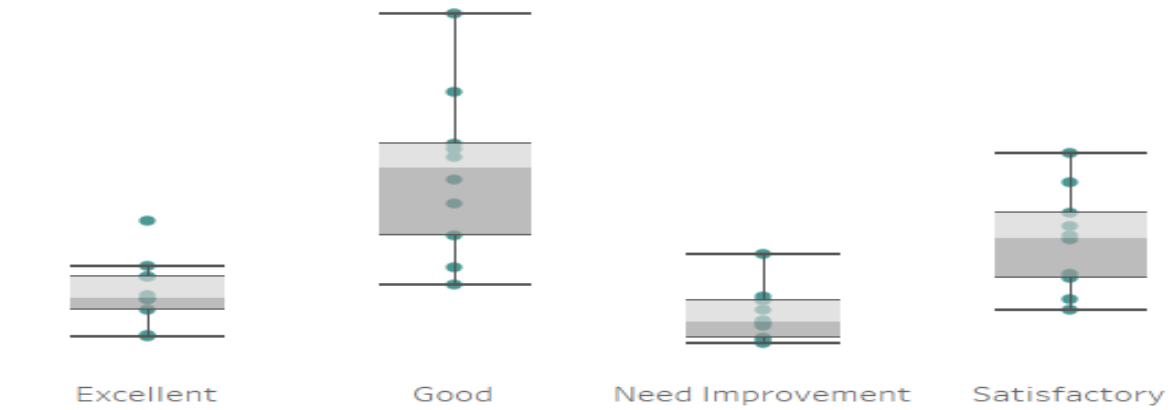
Employee Performance Analysis



Numbers of Employees



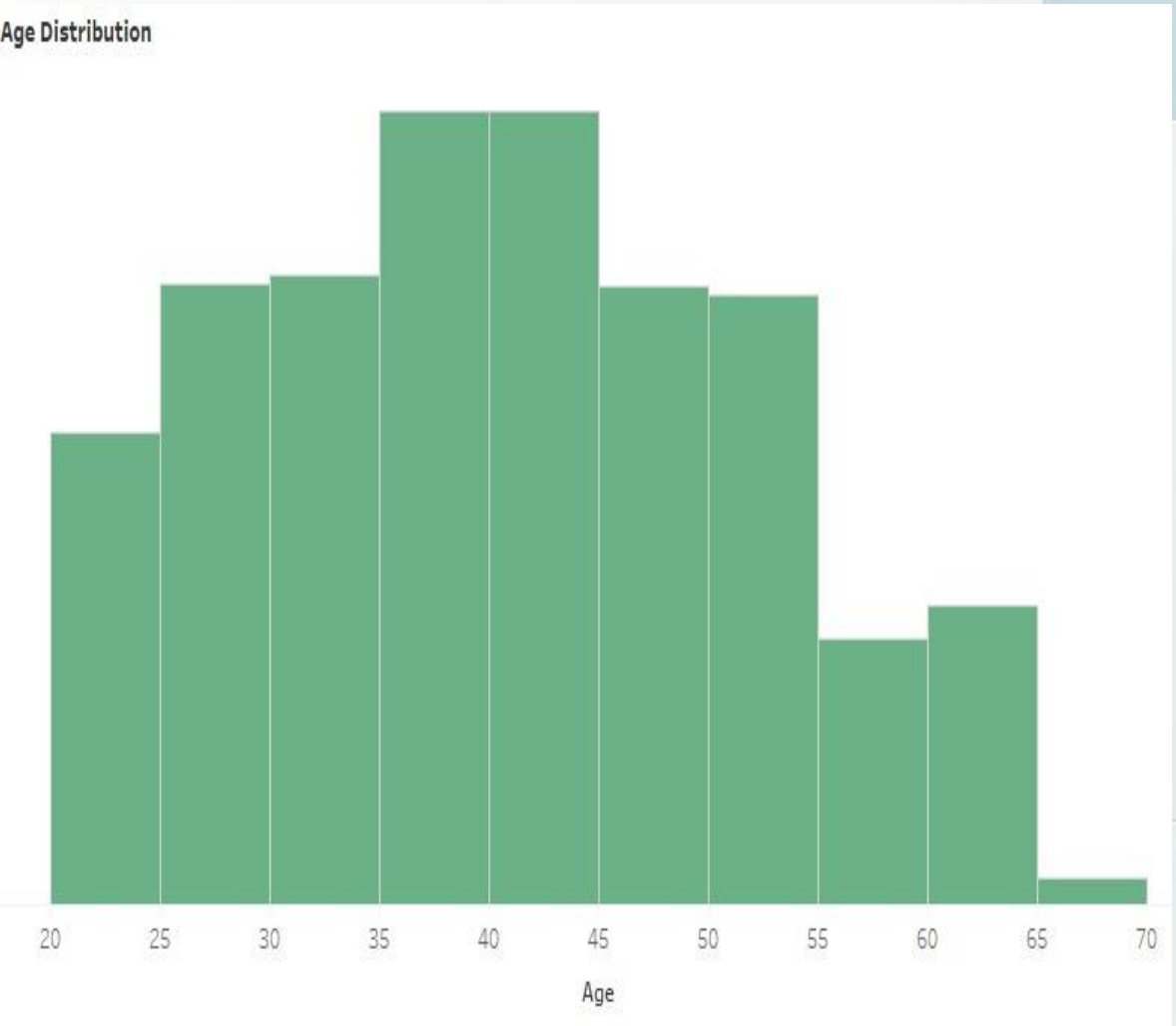
Performance Rating By Year



Total Employees	Average Salary	Average Years of Service	Total Employee Terminations
8,766	71K	4	966

Total Employees: The organization currently has a total of 8,766 employees contributing to its overall operations.
Average Salary: The average salary across all employees is approximately $71,000, reflecting the compensation structure within the company.
Average Years of Service: On average, employees have been with the organization for 4 years, indicating a moderate level of employee retention.
Total Number of Terminations: There have been a total of 966 terminations, highlighting the need for ongoing analysis of workforce dynamics and employee satisfaction.

Age Distribution



The "Age Distribution" chart shows that the majority of employees fall between the ages of 30 and 50, with a peak around 35 to 45 years old. There are fewer employees in the younger age group (20 to 25) and those over 60. This distribution indicates a workforce that is predominantly mid-career, with a smaller representation of both entry-level and nearing-retirement age employees.

Salary Analysis by Department

Salary Analysis by Department

Department	
IT	81,970
Finance	76,549
Sales	76,148
Marketing	67,611
Customer Service	65,892
Operations	65,435
HR	64,099

The "Salary Analysis by Department" table highlights the average salaries across the organization's departments. IT leads with the highest average salary of 81,970, indicating a premium for technical expertise. Finance and Sales follow, with average salaries of 76,549 and 76,148, respectively. In contrast, the HR department has the lowest average salary at 64,099. These figures suggest that it may be beneficial to reevaluate the salary structures for HR and Operations to enhance their competitiveness in the market.

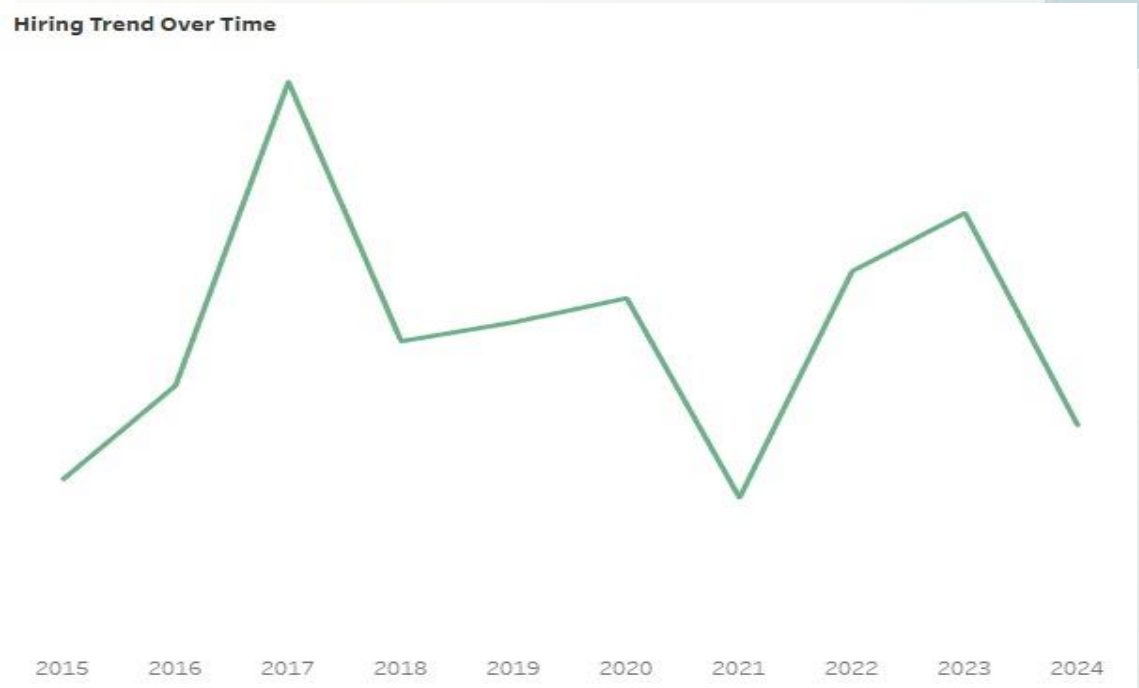
Employee Distribution by Gender and Department

Employee Distribution by Gender and Department

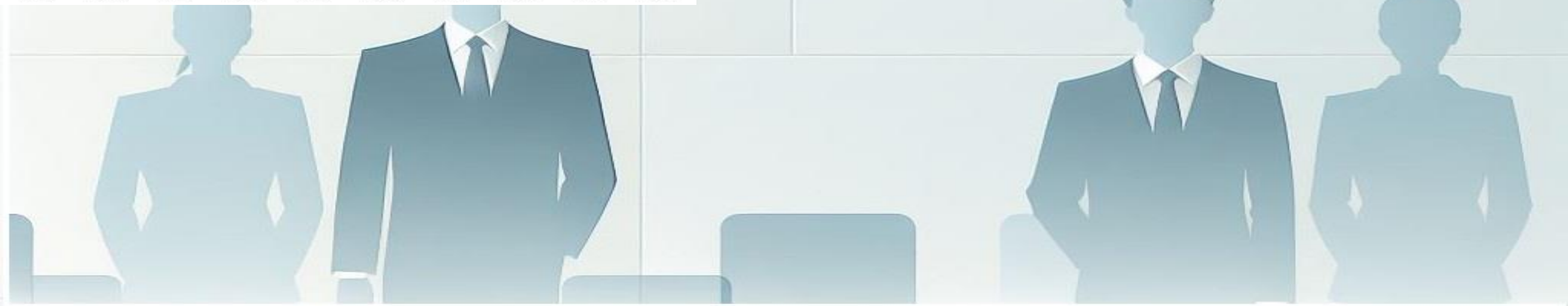
Department	Female	Male	Grand T..
Operations	1,226	1,442	2,668
Sales	845	960	1,805
Customer Service	759	881	1,640
IT	582	761	1,343
Marketing	343	359	702
Finance	208	236	444
HR	91	73	164
Grand Total	4,054	4,712	8,766

The "Employee Distribution by Gender and Department" table provides an overview of the number of male and female employees across the organization’s departments. The Operations department has the largest workforce, totaling 2,668 employees, with a relatively balanced distribution between genders. In contrast, the HR department has the smallest workforce, with only 164 employees. Across the organization, there are 4,054 female employees and 4,712 male employees. While most departments exhibit a balanced gender distribution, areas like Finance and HR could benefit from enhanced gender diversity. Analyzing the underlying factors influencing gender representation in specific departments may help shape future recruitment strategies.

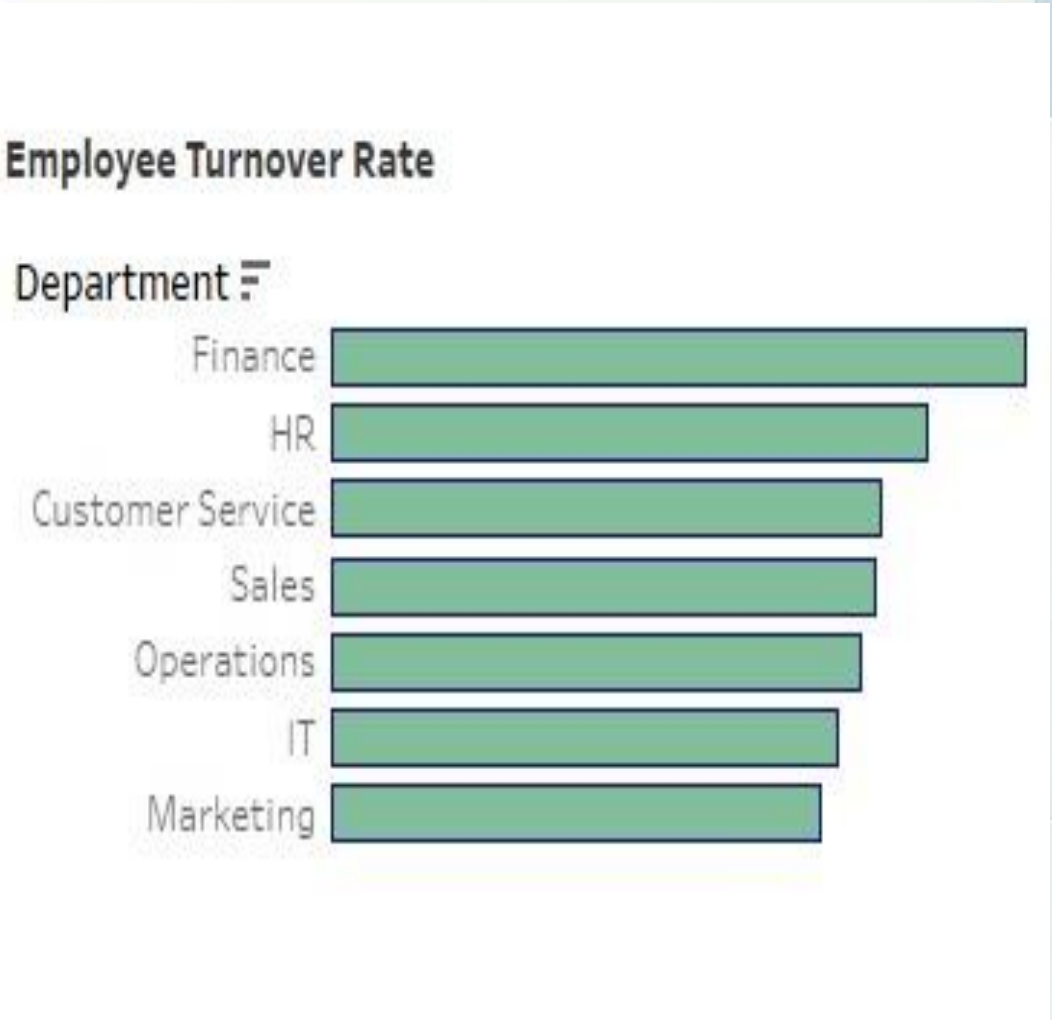
Hiring Trend Over Time



The "Hiring Trend Over Time" chart highlights the variations in employee hires from 2015 to 2024. The peak year was 2017, with 1,560 hires, followed by a drop in 2018 to 850 hires. The trend remained relatively steady through 2019 and 2020, with slight increases to 902 and 968 hires. A significant decrease occurred in 2021, hitting a low of 422 hires, but the numbers rebounded in 2022 and 2023, reaching 1,042 and 1,201 hires, respectively. In 2024, the hiring rate declined again to 620. These fluctuations suggest changes in recruitment strategies or market conditions affecting hiring practices.



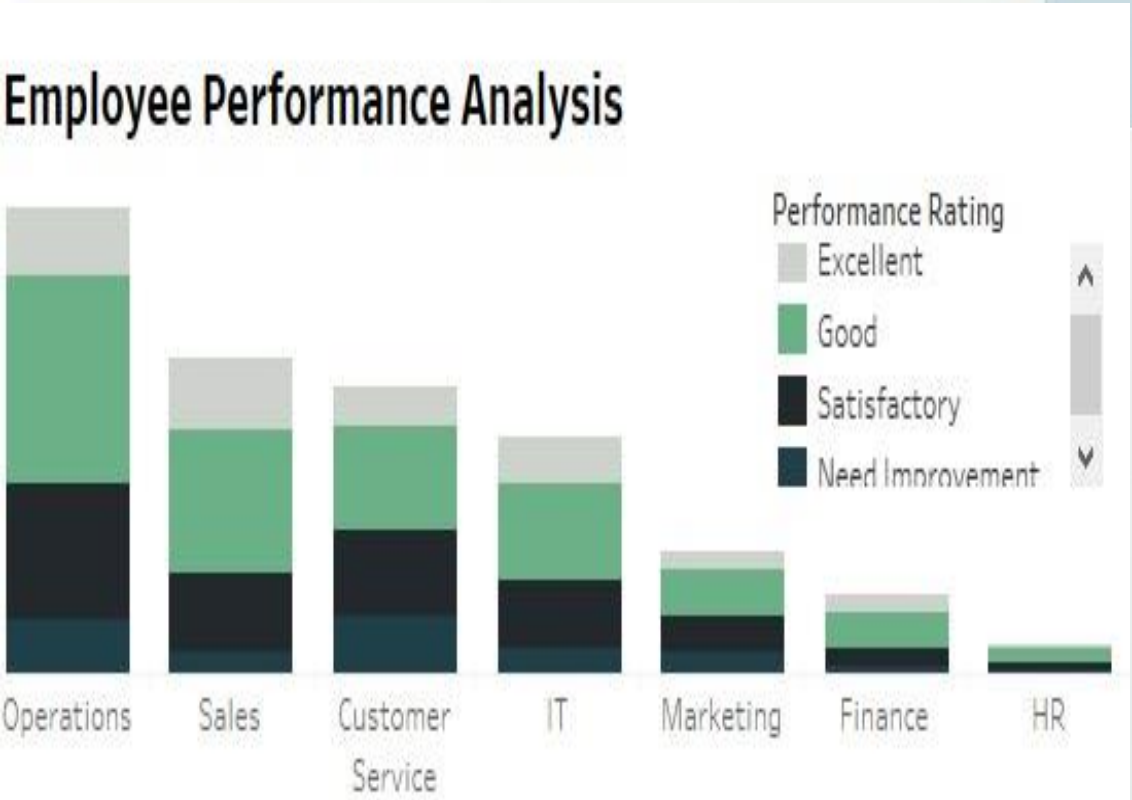
Employee Turnover Rate



The "Employee Turnover Rate" chart highlights that Finance has the highest turnover rate, followed by HR. In contrast, the IT department and Marketing have the lowest turnover rates. This indicates that Finance and HR may face challenges in retaining employees compared to other departments.

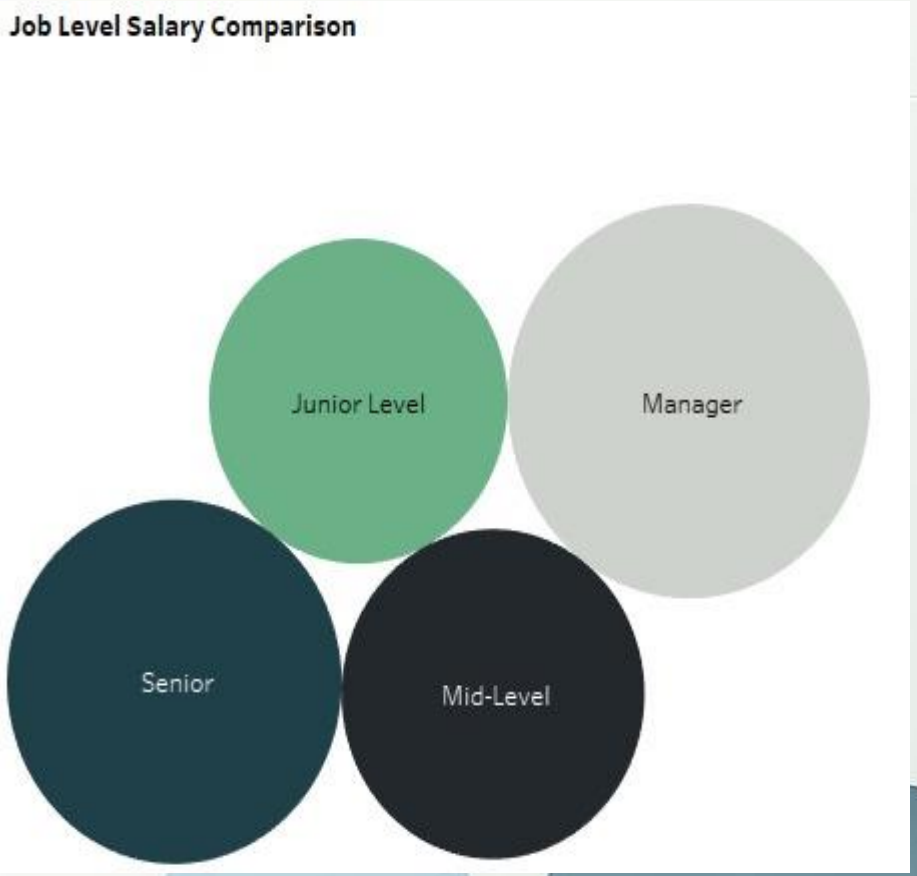
The IT department has the highest average salary and the lowest turnover rate. This suggests that good pay might help keep employees in IT. In Finance, even with a relatively high salary, the turnover rate is the highest. This means there could be other reasons people are leaving Finance. The HR department has the lowest salary but a moderate turnover rate. This shows that salary isn't the only reason affecting how long employees stay in a department.

Employee Performance Analysis



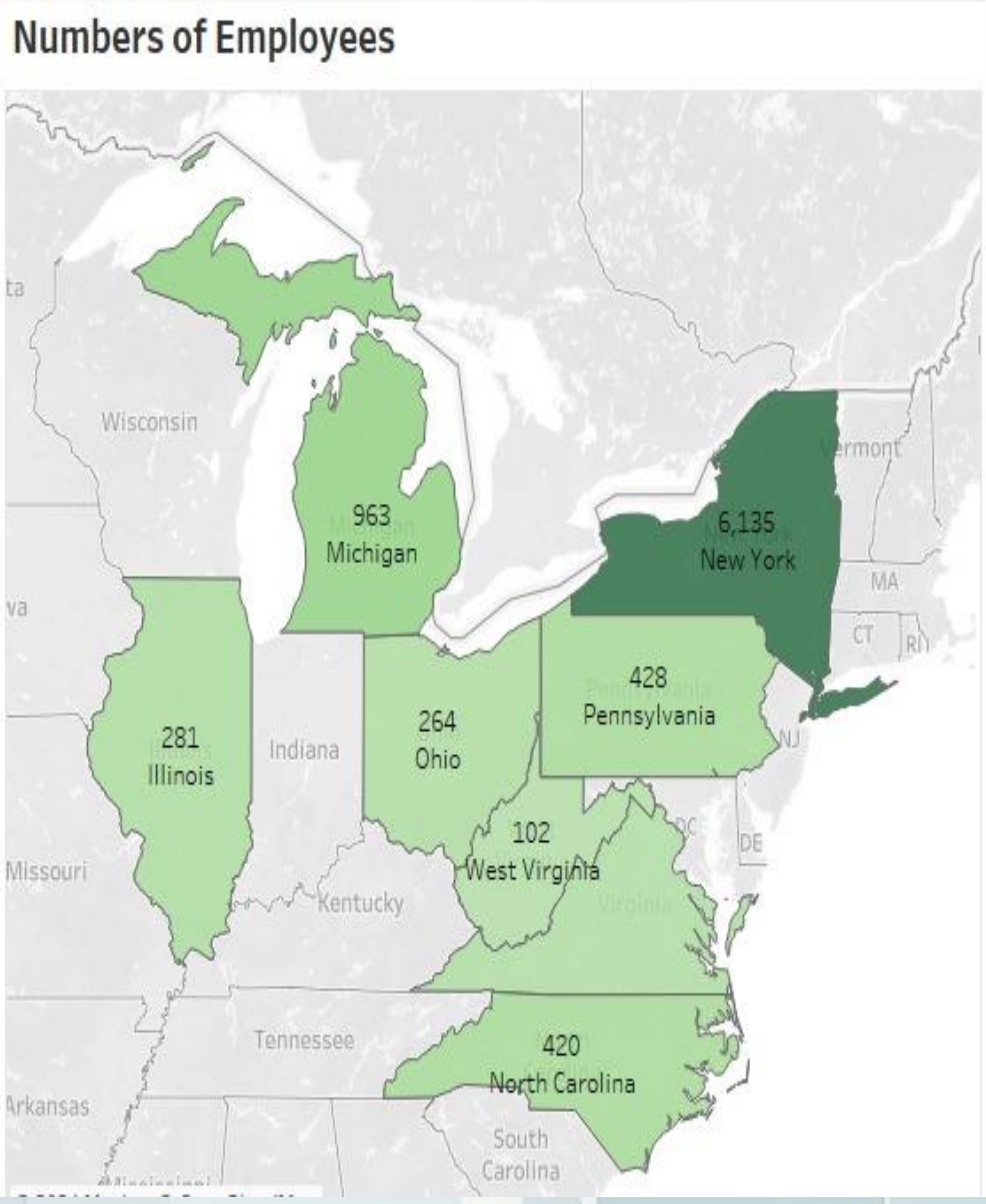
The "Employee Performance Analysis" chart indicates that the Operations department has a higher proportion of employees rated as "Excellent" or "Good" compared to other departments. Sales and Customer Service also have a notable percentage of high-performing employees but show a greater mix of performance ratings. IT, Marketing, Finance, and HR departments have fewer employees in the "Excellent" category, with HR having the highest percentage of employees needing improvement. This suggests that Operations is the strongest-performing department overall, while HR might need more focus on performance improvement.

Job Level Salary Comparison



The "Job Level Salary Comparison" highlights the differences in average salaries across various job levels within the organization. Managers earn the highest average salary at 97,000, reflecting their leadership roles and responsibilities. Senior-level employees follow with an average salary of 83,000, showing a significant jump from the mid-level roles. Mid-level positions have an average salary of 68,000, slightly higher than junior-level roles, which stand at 66,000. The relatively small difference between junior and mid-level salaries may suggest room for growth in mid-level compensation to better reward experience and skills development. Overall, the data indicates a clear salary progression aligned with job level, but opportunities exist to further differentiate mid-level roles.

Numbers of Employees



The "Employee Distribution by Location" report shows that New York has the largest workforce, significantly outpacing other states. Michigan follows as the second-largest location, with several other states contributing smaller numbers of employees. West Virginia has the fewest employees among all locations. This distribution highlights New York as the primary operational hub for the organization, while other states support its workforce in a more limited capacity.

Performance Rating By Year

The "Performance Rating by Year" chart presents the distribution of performance data across different categories over the years. Each box represents the interquartile range, showcasing the middle 50% of data, while the line inside indicates the median. Dots outside the box represent outliers, highlighting data points significantly different from the rest. The "Excellent" category shows a narrow distribution, indicating consistent performance among those rated as excellent, while the "Good" category displays a wider distribution, reflecting more variation in performance levels. The "Need Improvement" and "Satisfactory" categories also exhibit wider distributions, suggesting greater variability in performance ratings. Overall, the "Excellent" category has the most stable performance, while the other categories demonstrate more variability, which may indicate differences in evaluation criteria or fluctuating performance levels.

Conclusion & Recommendations

- **Conclusion**

1. Turnover Rates:
- The Sales and HR departments exhibit the highest turnover rates, indicating potential issues that need addressing.
- Research & Development and Marketing departments have lower turnover rates, suggesting better retention strategies or higher job satisfaction in these areas.

2. Salary Distribution:
- There are noticeable salary disparities, particularly in roles like HR Representatives, which may need to be addressed to ensure fair compensation practices.
- Males generally have higher average salaries compared to females, highlighting a potential gender pay gap.

3. Employee Demographics:
- The majority of employees are aged between 30 and 50, with fewer employees in the younger (20-25) and older (60+) age groups.
- The gender distribution is relatively balanced across most departments, though Finance and HR could benefit from enhanced gender diversity.

4. Performance Ratings:
- The Operations department has a higher proportion of employees rated as “Excellent” or “Good,” indicating strong performance in this area.
- HR has the highest percentage of employees needing improvement, suggesting a need for targeted performance enhancement initiatives.

5. Years of Service and Salary:
- Employees with more years of service tend to have higher salaries, though the correlation is not very strong.
- The highest salaries are observed at the managerial level, with a clear progression in salary with job level.

Recommendations

1. **Address High Turnover in Sales and HR**:
    1. Conduct exit interviews to understand the reasons behind high turnover in these departments.
    2. Implement retention strategies such as career development programs, mentorship, and improved work-life balance initiatives.
2. **Review and Adjust Salary Structures**:
    1. Conduct a comprehensive salary review to address disparities, particularly focusing on roles with significant variability and gender pay gaps.
    2. Consider implementing transparent salary bands and regular salary audits to ensure fair compensation practices.
3. **Enhance Gender Diversity**:
    1. Develop targeted recruitment strategies to improve gender diversity in departments like Finance and HR.
    2. Promote an inclusive workplace culture that supports diversity and equal opportunities for all employees.
4. **Improve Performance in HR**:
    1. Provide additional training and development opportunities for HR employees to enhance their skills and performance.
    2. Set clear performance goals and provide regular feedback to help employees in HR improve their performance ratings.
5. **Support Career Development**:
    1. Implement career development programs that support employees in their professional growth and help them progress to higher job levels.
    2. Encourage continuous learning and provide opportunities for employees to acquire new skills and advance their careers within the organization.
6. **Monitor and Adjust Hiring Practices**:
    1. Analyze hiring trends to understand the factors influencing fluctuations in recruitment and adjust strategies accordingly.
    2. Ensure that hiring practices are aligned with the organization’s long-term goals and workforce planning needs.

- By implementing these recommendations, the organization can improve employee satisfaction, retention, and overall performance, leading to a more effective and motivated workforce.