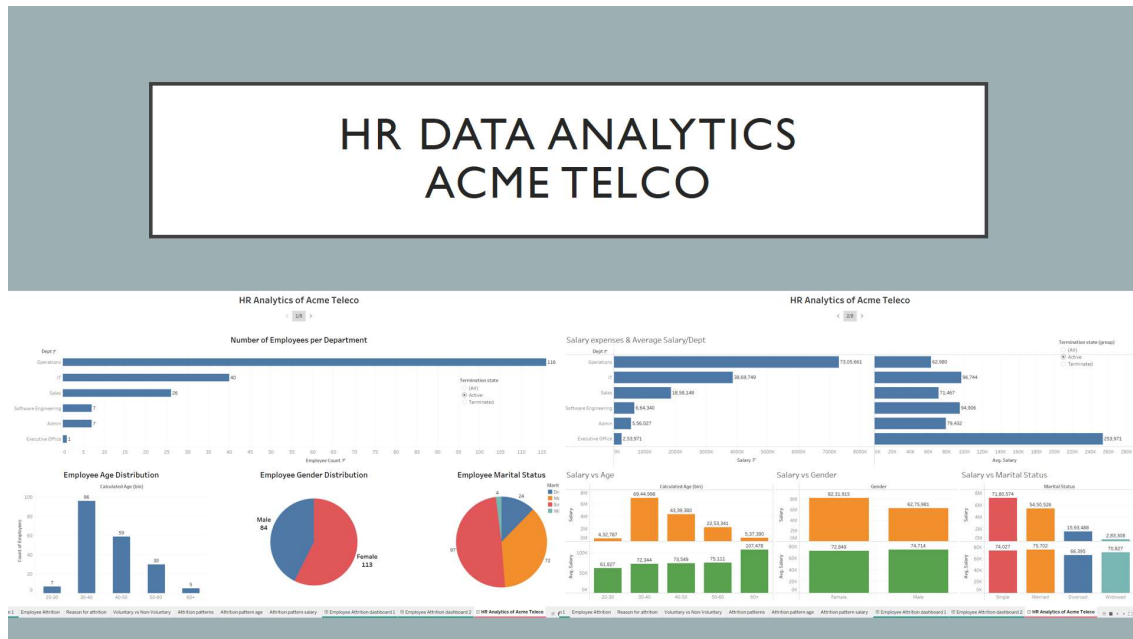


DATA VISUALIZATION USING TABLEAU



Conducting a detailed study and present a detailed visual analysis to help improve company image among the public and the employees, increase employee satisfaction and control attrition.

Date	27/07/2021
Name	Vinit Ravichandran Iyer

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About the Company

Acme Telco is a small telecom company that develops, sells, and installs telecommunication devices such as network routers, conference call hardware, etc. for business needs. Acme has been operating for over a decade with a modest current headcount of close to 200 people and it has organized itself around the following 5 departments: Operations, IT, Sales, Software engineering, and Admin.

Acme Telco has been having a stressed financial situation for quite some time resulting in general unhappiness among its employees. Acme has a long-standing tradition of conducting employee satisfaction surveys but it has not paid attention to the detailed results coming out of the survey. Also, same with the attrition situation.

The current President & CEO of the company: Mrs. Jan Ramsey

The current Chief Information Officer (CIO): Mrs. Jen Heinz

Problem Question

Conduct a detailed study and present your findings. Based on your recommendations, the company may take several actions that will help improve the company image among the public and the employees, increase employee satisfaction and control attrition, etc.

Expectations

1. Group Size and Demographics
 - a. How many employees are currently employed by each department?
 - b. What are the demographics of our current employees?
 - Age
 - Gender
 - Marital Status
2. Salary Structure
 - a. What was the current total salary expense for each department?
 - b. What is the salary structure for each demography of our current employees?
 - Age
 - Gender
 - Marital Status
3. Performance Results
 - a. What was the distribution of employees in terms of their performance?
 - b. Could we do a deep dive per group?
 - Department
 - Age
 - Gender
 - Marital Status
4. Satisfaction Scores
 - a. How satisfied our employees are?
 - b. Could we do a deep dive per group?
 - Department
 - Position
 - Age
 - Gender
 - Marital Status
5. Attrition
 - a. How many employees have left the company in total?
 - b. What were the main reasons for them to leave?
 - c. How many of those reasons are voluntary and non-voluntary?
 - d. Is there some pattern related to the employee groups?
 - Department
 - Age
 - Gender
 - Marital Status

About the Data

After spending a considerable amount of time, the BI team unearthed three different data sets containing:

- Basic Employee Data
- Employee performance and attendance data
- Employee salary data

The employee ID has been randomized and encoded, and the employee names have been masked in order to protect employee's personal information. The data is presented in three different sets in order to protect confidential information such as salary or performance scores from being circulated to a wider audience. Employee ID is a unique number that is present across all three datasets to allow joining the tables.

Modifications to the Data

1. Data is connected to Tableau through the following steps:
Connect → To a File → Microsoft Excel → Select File → Open
2. Data is connected in Tableau using Data Blending. The final Data model looks like the following:



3. Data is checked. The Data is given as below:
 - a. HR Information System – HRIS-1
 - i. Employee ID
 - ii. Position
 - iii. DOB
 - iv. Gender
 - v. Marital Status
 - vi. Date of Hire
 - vii. Date of Termination
 - viii. Termination Reason
 - ix. Employment Status

- b. HR Information System – HRIS 2
 - i. Employee ID
 - ii. Dept
 - iii. Manager Name
 - iv. Perf Score
 - v. Emp. Sat
 - vi. Date of last Perf. Review
 - vii. Late Days
 - viii. Absent Days
- c. Financial Information System – FIS
 - i. Employee ID
 - ii. Salary

4. Data is cleaned as given below:

- a. Termination reasons are quite detailed. So, we will group them into some high-level groups.
 - i. Career Issues: Career change, found a better job, went for higher paying job.
 - ii. Personal Issues: Did not return from maternity, health, higher education, relocated, sabbatical.
 - iii. Employee Issues: Absconded, attendance, legal issues, misconduct, performance issues, Unhappy.
 - iv. NA – Still Employed
- b. Positions are also quite many and thus are grouped into the following:
 - i. Senior Management: CEO, CIO & Directors
 - ii. Middle Management: All positions having “Manager”
 - iii. Employees: Everyone Else
- c. Employment Status is also grouped into the following:
 - i. Active
 - ii. Terminated: Terminated for a cause and Voluntarily Terminated
- d. Rename the field “Employment Status” to “Termination Type”.
- e. We create a calculated field named “Calculate Age” using the following formula:

Calculated Age

×

```

IF DATEADD('year', DATEDIFF('year', [DOB], TODAY()), [DOB]) > TODAY() THEN
    DATEDIFF('year', [DOB], TODAY())-1
ELSE
    DATEDIFF('year', [DOB], TODAY())
END
          
```

The calculation is valid.

6 Dependencies ▾

Apply

OK

- f. We create a calculated field named “Termination Count” using the following formula:

Termination Count

```

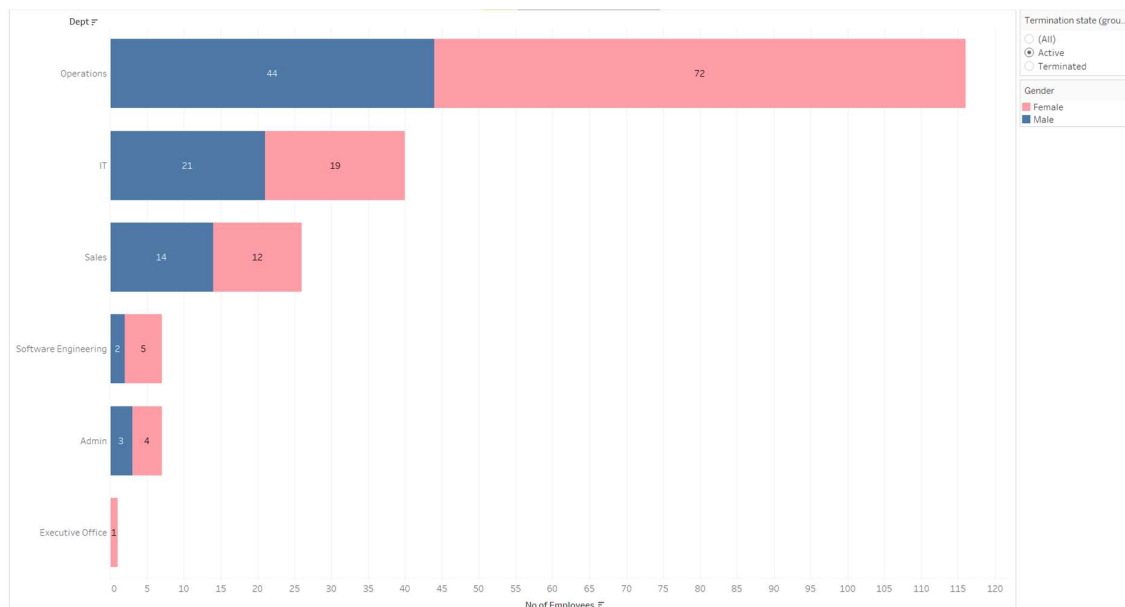
IF [Employment status (group)] = "Active" THEN 0
ELSE 1
END

```

The calculation is valid. 1 Dependency
Apply
OK

- g. Create bins for “Calculated Age” with a step size of 10.

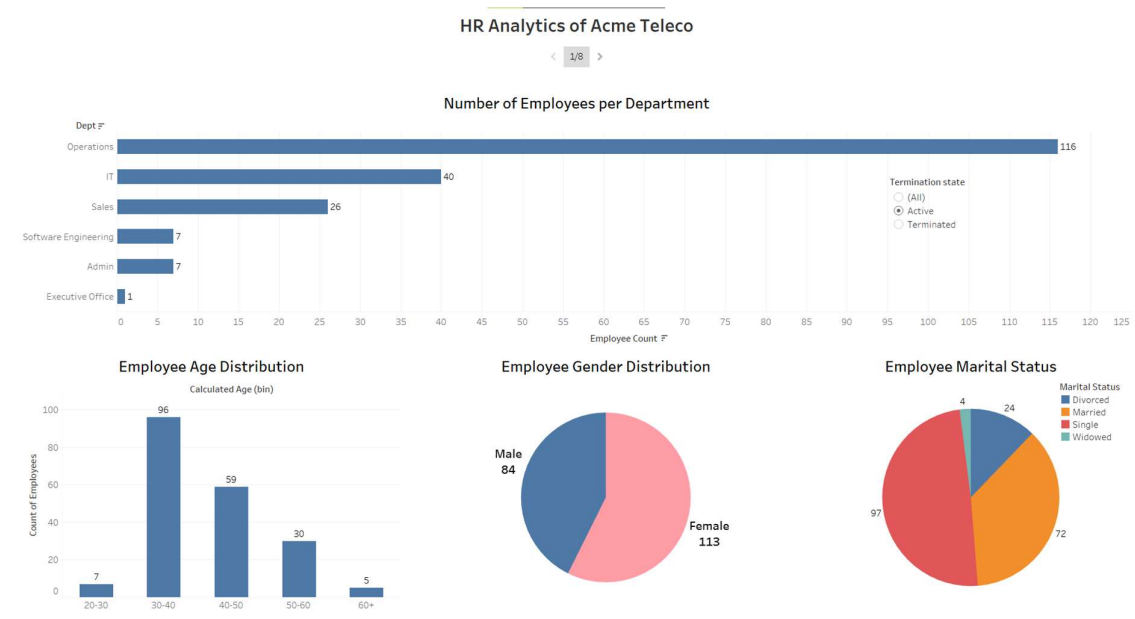
Company Employee Portfolio at a glance



Observations:

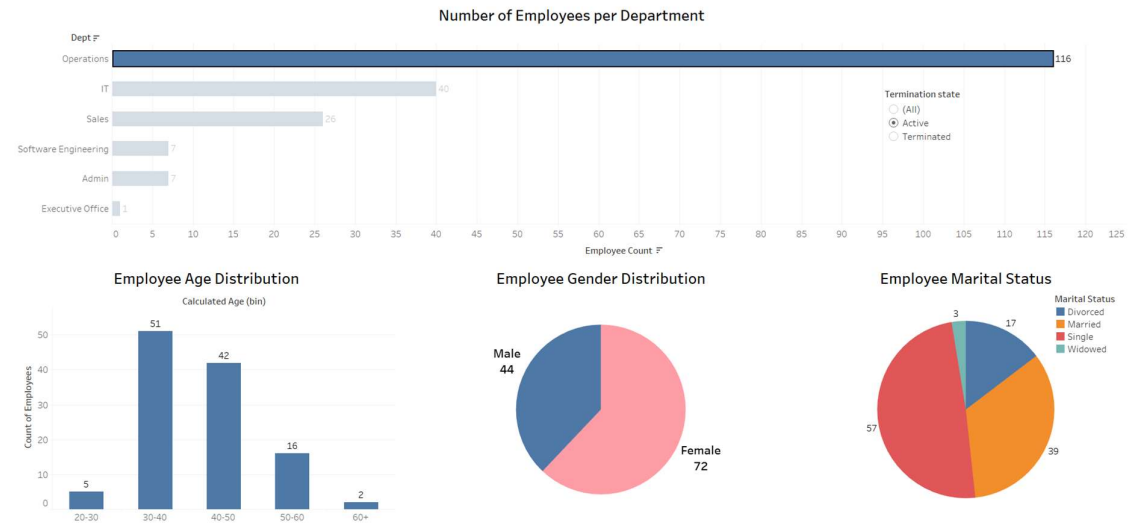
- The total number of active employees of the company is 197.
- The operations department is by far the largest department holding a total of 116 active employees.
- The second largest department is the IT department which is not even half the size of the Operations department.
- The company is more female dominated than males.
- IT, Sales and Admin department have more or less an equal ratio of males and females working in the respective department.

Observations on Expected Analysis



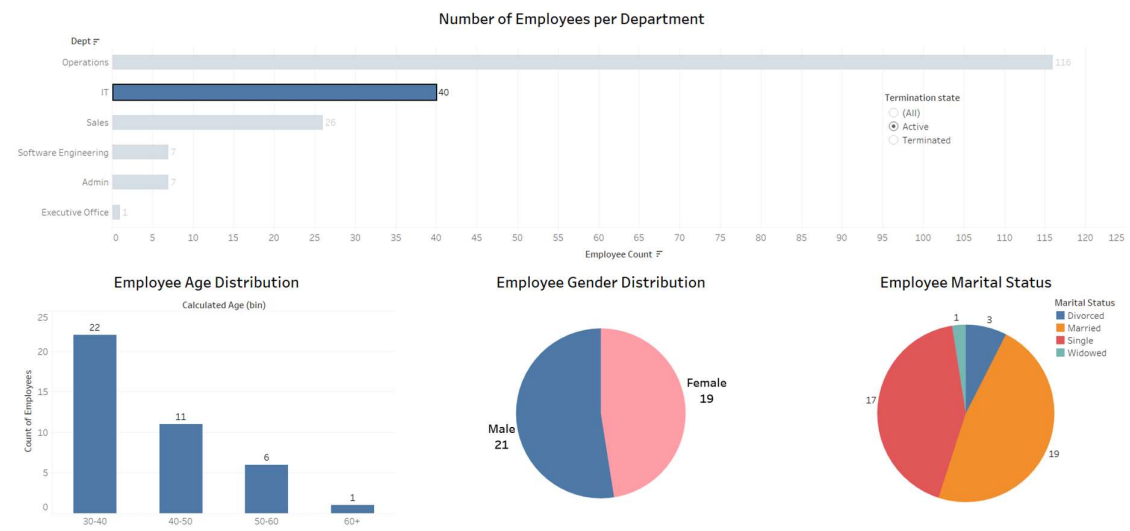
Observations:

- The total number of active employees in each department are:
 - Operations : 116 (Largest)
 - IT : 40
 - Sales : 26
 - Software Engineering : 7
 - Admin : 7
 - Executive office : 1 (Smallest)
- The total number of active employees over different age groups are:
 - 20-30 : 7
 - 30-40 : 96 (Most)
 - 40-50 : 59
 - 50-60 : 30
 - 60+ : 5 (Least)
- The company is female dominated as:
 - Number of Males : 84
 - Number of Females : 113
- The company employees have a vast distribution over their marital status as:
 - Single : 97
 - Married : 72
 - Divorced : 24
 - Widowed : 4



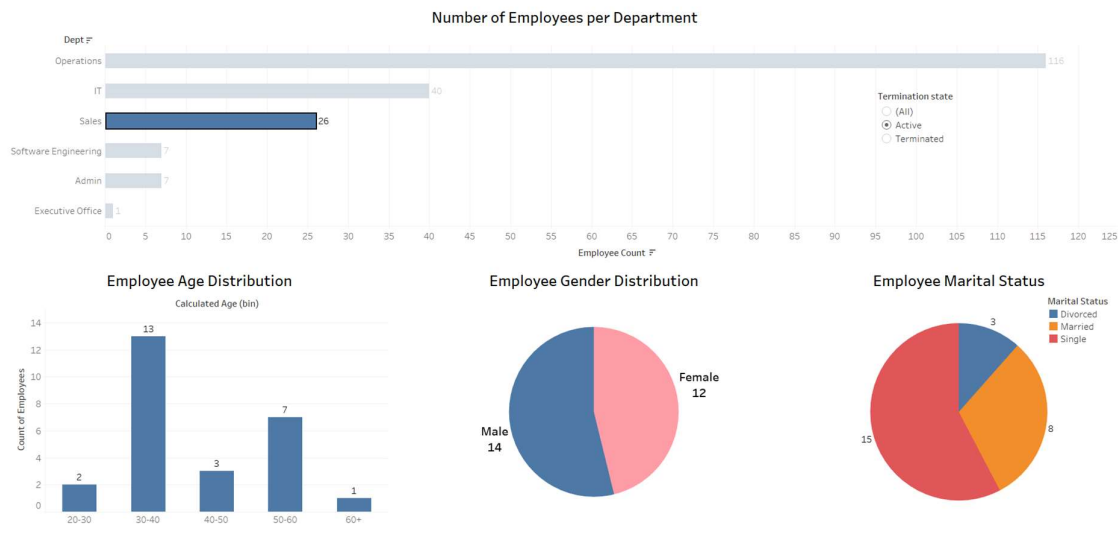
Observations:

- Total number of employees in Department of Operations is 116.
- The age distribution of employees in the Operations Department is:
 - 20-30 : 5
 - 30-40 : 51 (Most)
 - 40-50 : 42
 - 50-60 : 16
 - 60+ : 2 (Least)
- The Operations department is female dominated as:
 - Number of males : 44
 - Number of females : 72
- The Marital status of the employees of Operations Department is:
 - Single : 57
 - Married : 39
 - Divorced : 17
 - Widowed : 3



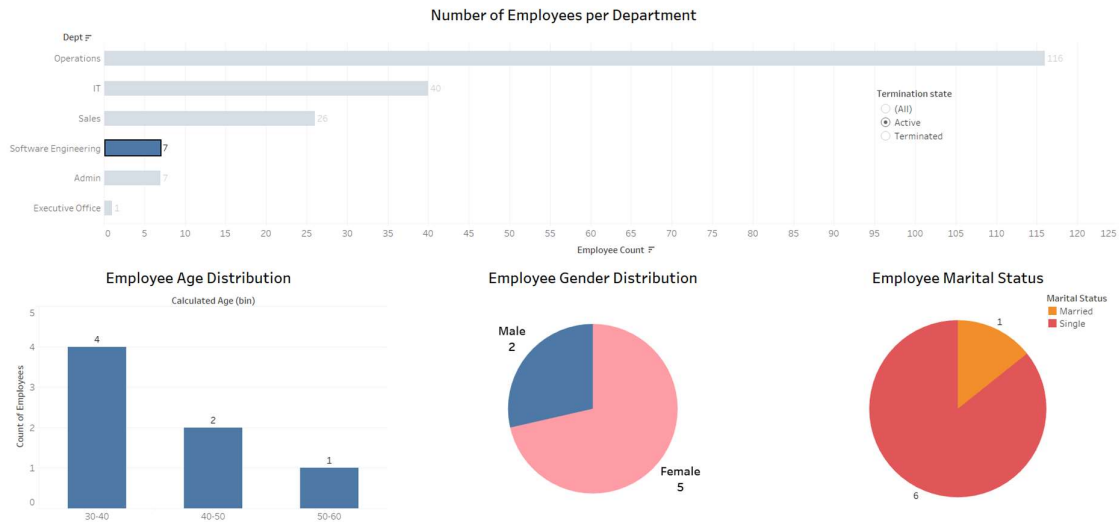
Observations:

- Total number of employees in Department of IT is 40.
- The age distribution of employees in the IT Department is:
 - 20-30 : 0 (None)
 - 30-40 : 22 (Most)
 - 40-50 : 11
 - 50-60 : 6
 - 60+ : 1
- The IT department is almost equal in gender ratio as:
 - Number of males : 21
 - Number of females : 19
- The Marital status of the employees of IT Department is:
 - Single : 17
 - Married : 19
 - Divorced : 3
 - Widowed : 1



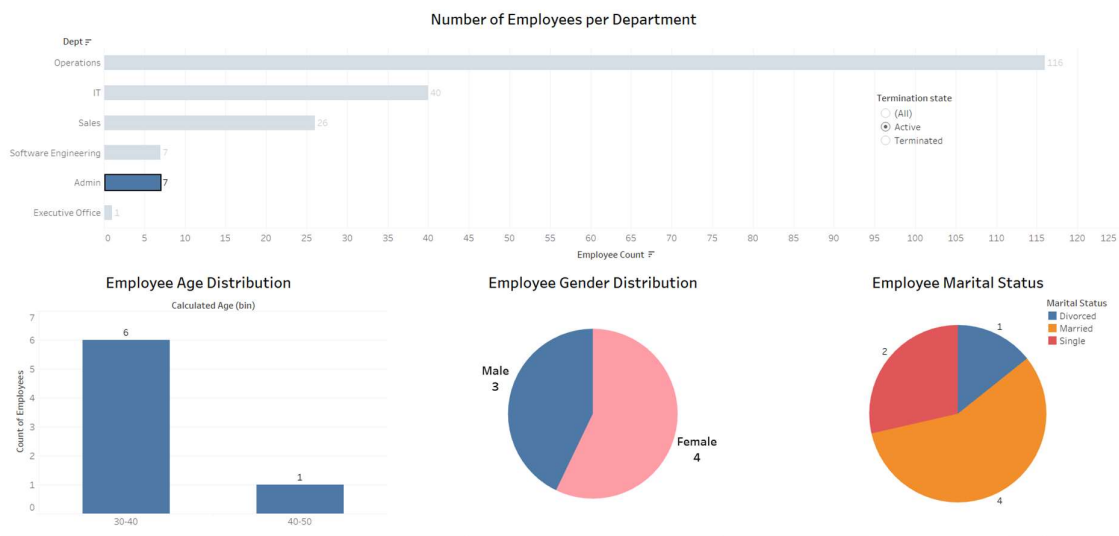
Observations:

- Total number of employees in Department of Sales is 26.
- The age distribution of employees in the Sales Department is:
 - 20-30 : 2
 - 30-40 : 13 (Most)
 - 40-50 : 3
 - 50-60 : 7
 - 60+ : 1 (Least)
- The Sales department is almost equal in gender ratio as:
 - Number of males : 14
 - Number of females : 12
- The Marital status of the employees of Sales Department is:
 - Single : 15
 - Married : 8
 - Divorced : 3



Observations:

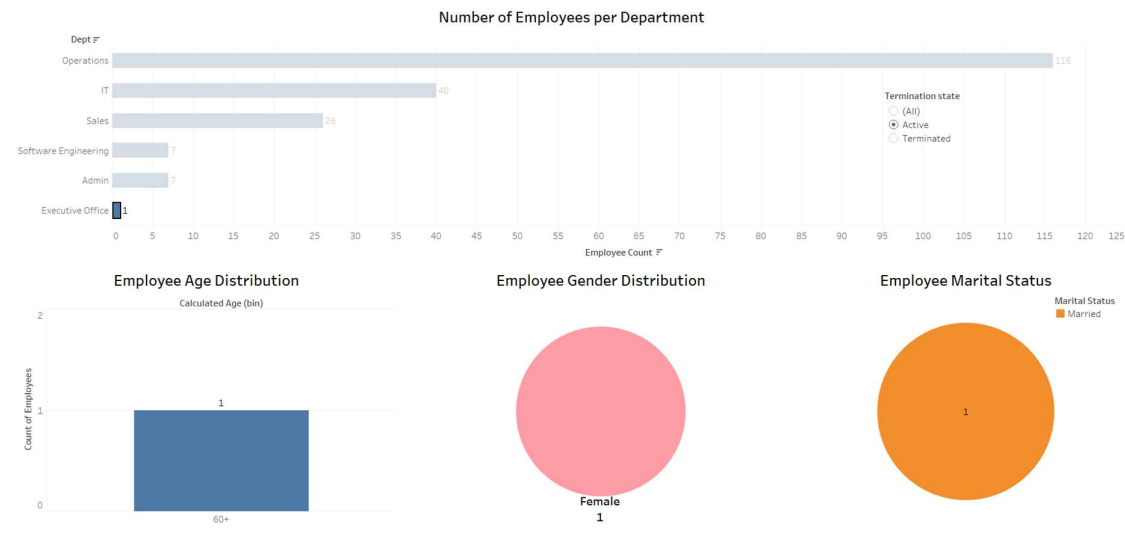
- Total number of employees in Software Engineering Department is 7.
- The age distribution of employees in the Software Engineering Department is:
 - 30-40 : 4 (Most)
 - 40-50 : 2
 - 50-60 : 1 (Least)
- The Software Engineering Department is female dominated as:
 - Number of males : 2
 - Number of females : 5
- The Marital status of the employees of Software Engineering Department is:
 - Single : 6
 - Married : 1



Observations:

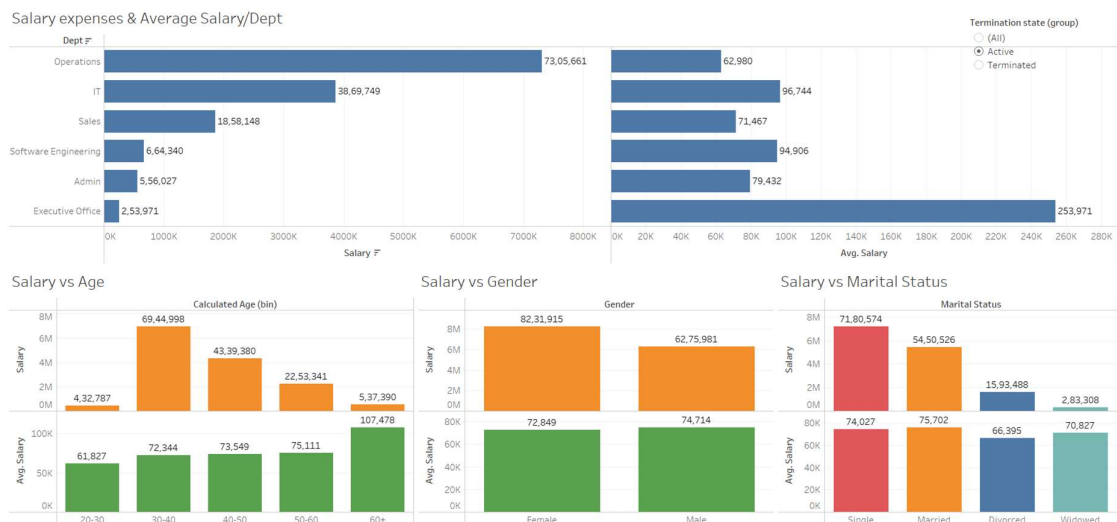
- Total number of employees in Admin Department is 7.

- The age distribution of employees in the Admin Department is:
 - 30-40 : 6
 - 40-50 : 1
- The Admin department is almost equal in gender ratio as:
 - Number of males : 3
 - Number of females : 4
- The Marital status of the employees of Admin Department is:
 - Single : 2
 - Married : 4
 - Divorced : 1



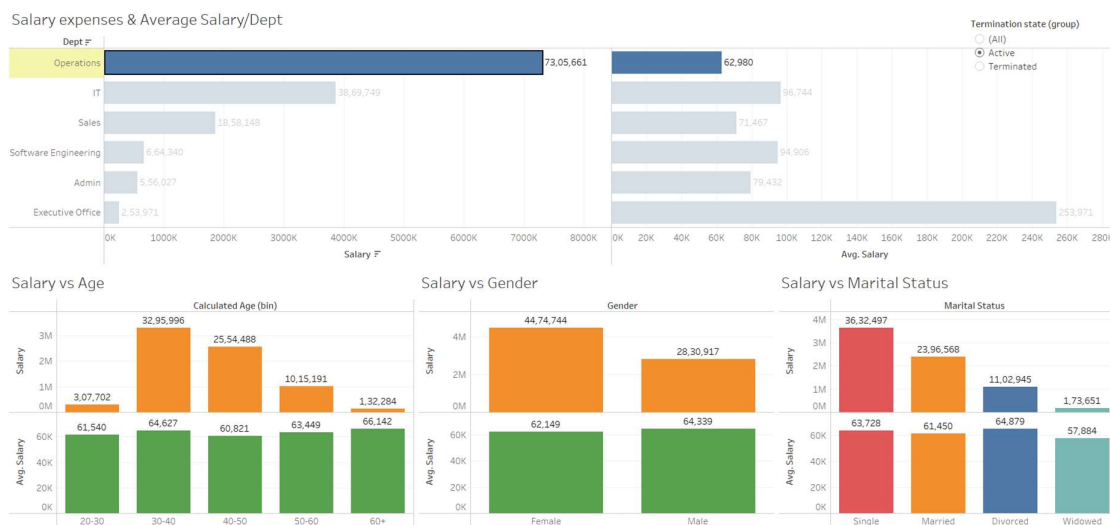
Observations:

- The Executive department holder is 60+, female and married.



Observations:

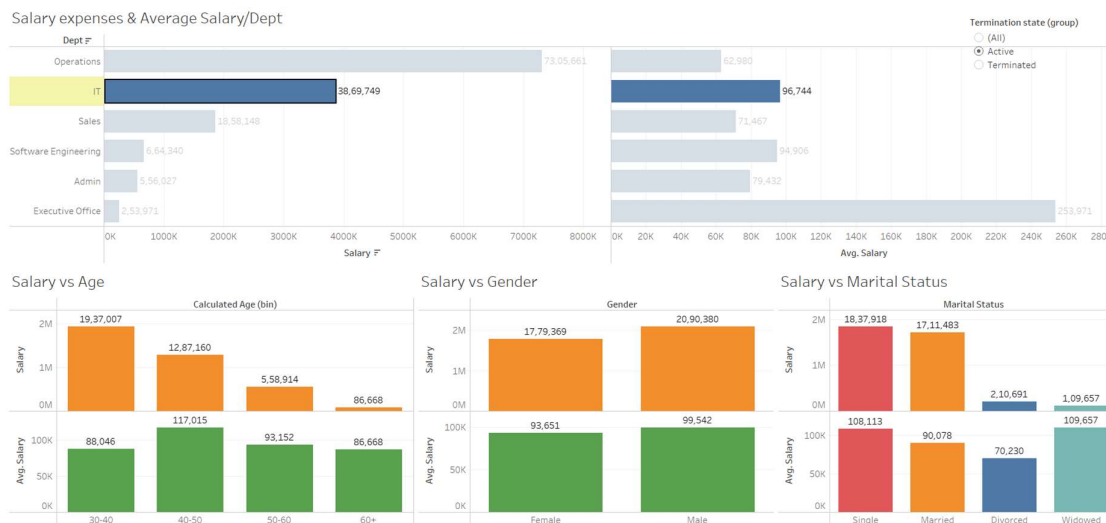
- Operations department has the highest salary expenses and yet has the lowest average salary when compared with the other departments.
- IT and Software Engineering department has the highest average salary.
- Considering only 1 personnel in the Executive office, the person has the highest Salary when compared to others.
- The average salary for employees aged above 60 is by far the highest.
- The highest salary expense is observed to be on the employees of the age group of 30-40.
- The lowest salary expense and lowest average salary of the employees are for those in the age group of 20-30, presumable due to the young age and lacking experience.
- The average pay between Men and women has a difference of approximately \$1900 which shows that the company is more or less Gender neutral.
- The salary expense of women is greater than men hinting the fact that the company has more number of female employees than males.
- There are many single and married employees and their average salary is near about the same.
- The number of single employees is higher than married employees as seen by the high amount of salary expenses of single employees.



Observations:

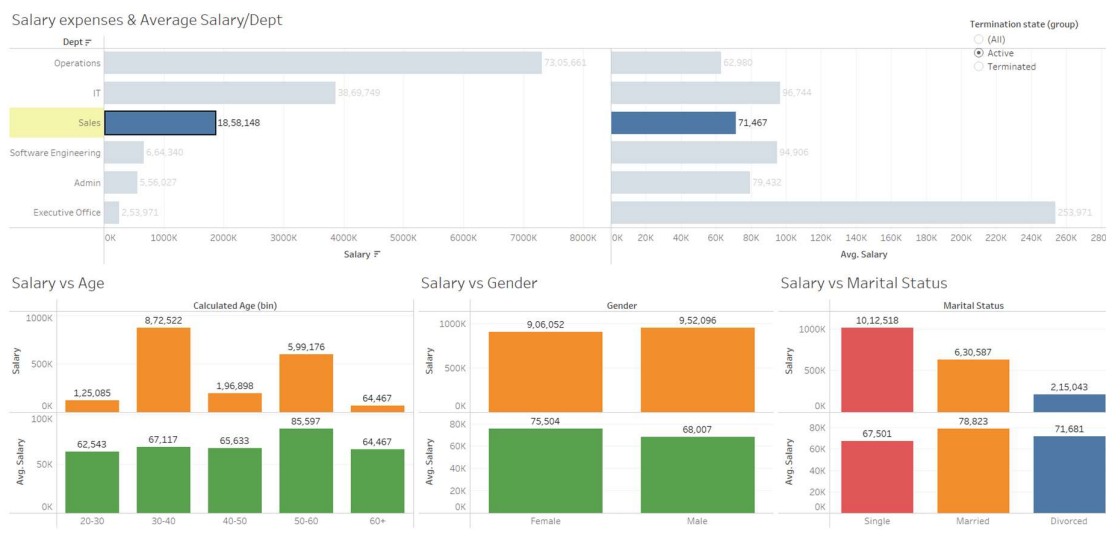
- Operations department has the highest salary expenses yet the least average salary of all other departments.
- Majority number of employees working in the operations department are aged around 30-40 considering the high salary expense of the age group as compared to other age groups.
- The salary of employees in the Operations department doesn't seem to have any dependencies on the age group.
- The operations department has a higher number of female employees as seen by the salary expense on the female employees.
- The average salary between the females and males are almost the same which might depict gender neutrality.

- *The salary of employees in the Operations department doesn't seem to have any dependencies on the marital status.*



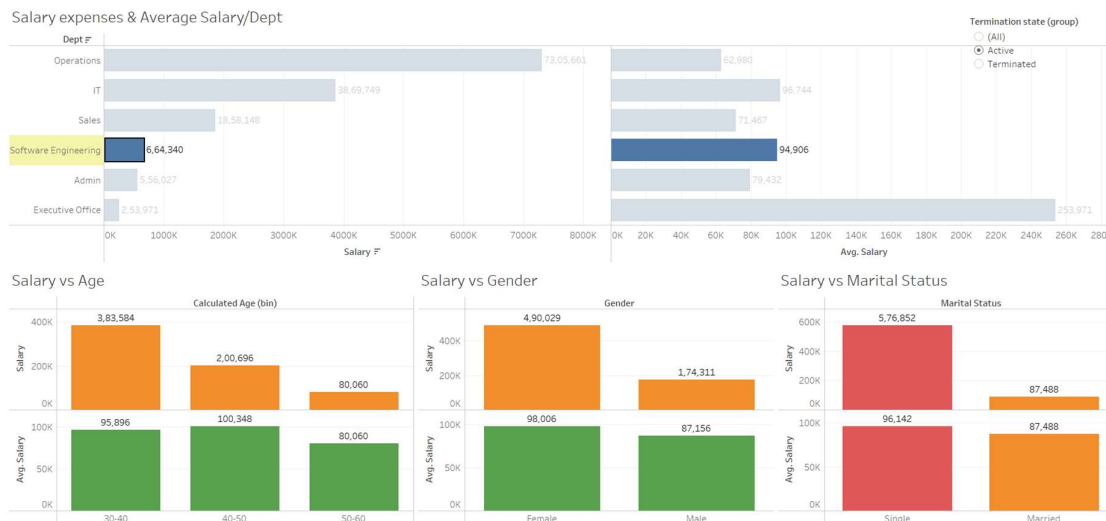
Observations:

- *There are no employees in the age group of 20-30 in the IT department.*
- *It has the highest average salary compared to other departments excluding the Executive office.*
- *People in the age group of 40-50 have the highest average salary in the department as compared to the other age groups.*
- *The IT Department seems to have more male employees than females.*
- *It seems that the male employees in the department are paid more than their female counterparts as the average difference between them is greater than \$5000.*
- *At a glance it seems that single and widowed employees have more average salary compared to the married or divorced employees of the IT Department.*



Observations:

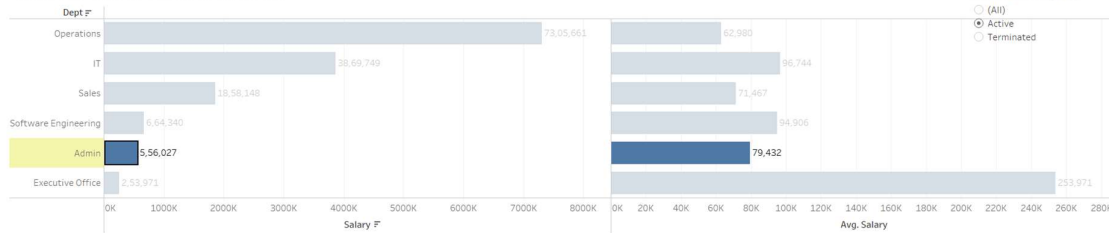
- *The employees from the Sales department have the least average salary as compared to the other departments.*
- *The employees from age group 50-60 have the highest average salary as compared to the other age groups.*
- *The other age groups have more or less similar average salary.*
- *Age group of 30-40 have the highest salary expense in the Sales Department.*
- *There is a huge difference in the average salary between male and female employees in the Sales department with the female employees receiving more than \$5000 the average salary of their male colleagues.*
- *There are no widows in the sales department.*
- *Married employees have the highest average salary followed by divorced employees then the single employees.*
- *There are more number of single employees as seen by the salary expense of the department on the single employees.*



Observations:

- *The software department have low number of employees but high average salaries.*
- *There are no employees in the age group of 20-30 and 60+ in the SD Department.*
- *The average salary of the age groups 30-40 and 40-50 is almost in the same range but has a difference of approximately \$5000 whereas there is a huge gap between their salary and the average salary of the age group 50-60.*
- *There is only 1 person in the age range of 50-60 in the SD Department.*
- *There is a huge difference between the average salary of the female and male employees of the SD Department with the female employees earning an average salary of more than \$10,000 than the male employees.*
- *The department has mostly single employees with the exception of one married person.*

Salary expenses & Average Salary/Dept



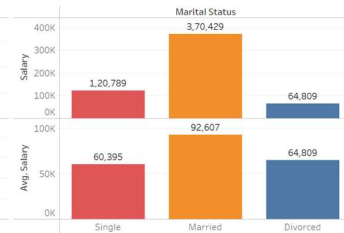
Salary vs Age



Salary vs Gender



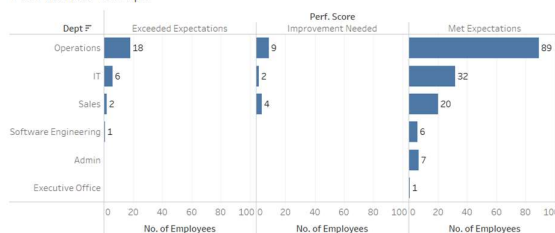
Salary vs Marital Status



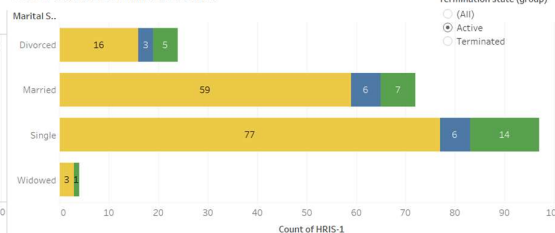
Observations:

- The admin department has the lowest salary expense excluding the sole employee of the Executive office.
- There is a huge difference in average salary between the age groups of 30-40 and 40-50.
- There are no employees in the age group of 20-30 and 50+.
- The average salary ratio between the male and female employees of the department is a bit skewed considering the higher average salary of a female employee of the department.
- Married employees seemingly have a higher average salary as compared to the single or divorced colleagues.

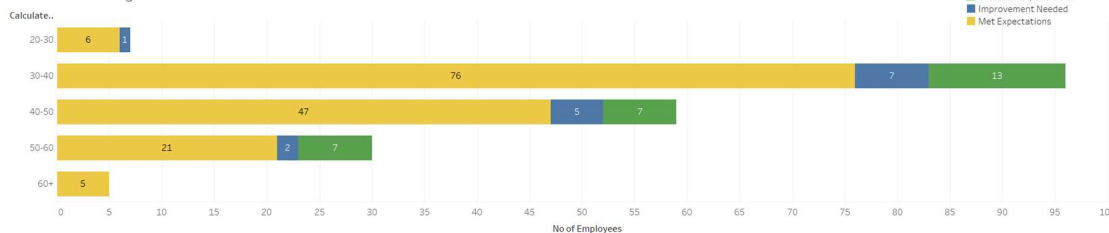
Perf results vs Dept



Perf results vs Marital Status



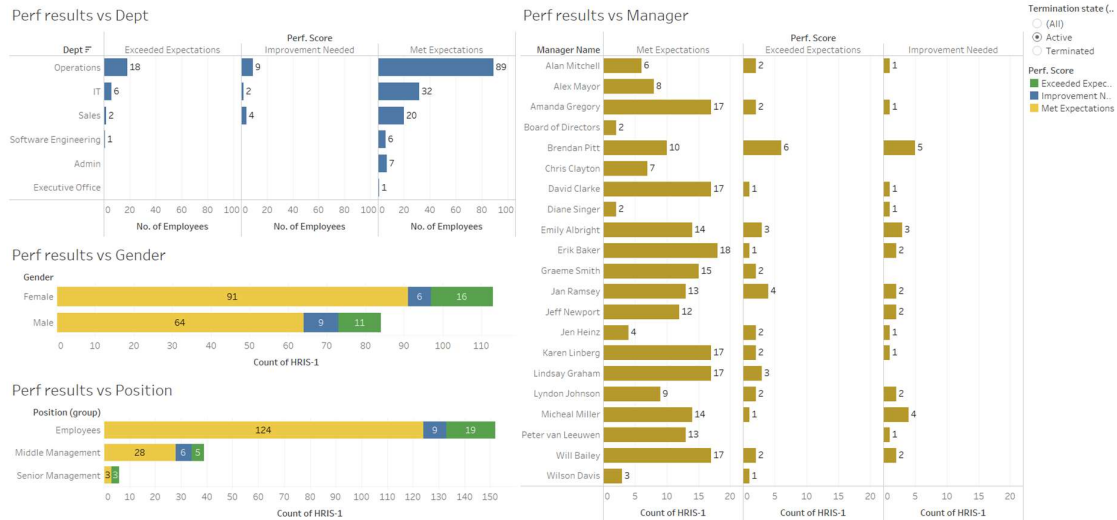
Perf results vs Age



Observations:

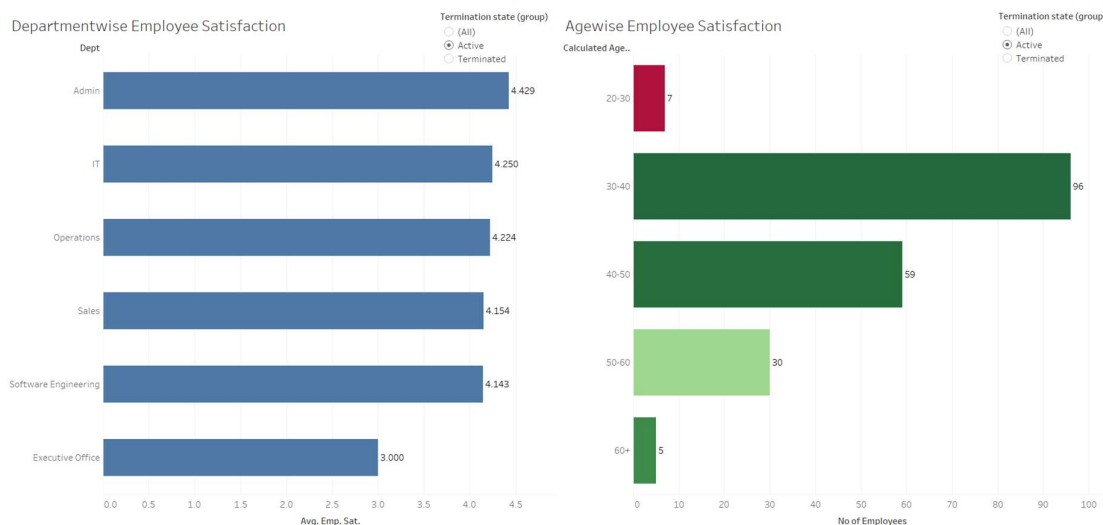
- Majority of the employees have met expectations regarding their performance.
- Only a few employees did not meet the expectations whereas a good number of employees actually exceeded expectations.

- Majority of the employees which exceeded expectations seem to be single.
- Majority of the employees which exceeded expectations are from the age group of 30-40.



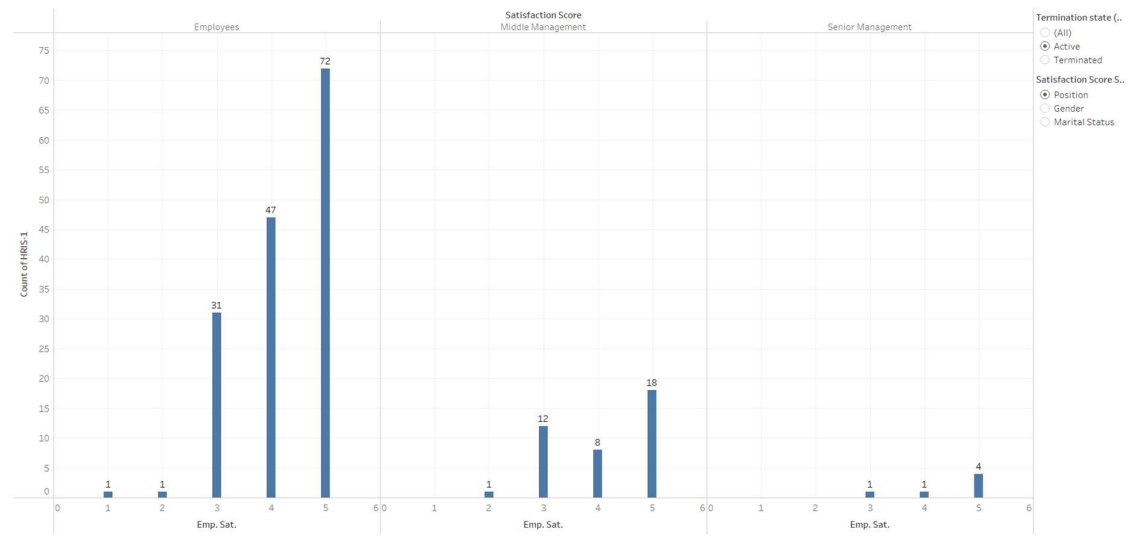
Observations:

- Majority of the employees which exceeded expectations stem from the female employees.
- Majority of the employees requiring improvement stem from the male employees.
- In terms of position, Employees are seen to have been exceeding expectations as compared to the number of employees in the middle and senior level management.
- It can be noted that the 6 employees under Mr. Brandon Pitt have exceeded expectations but at the same time 5 of his team members require improvement.
- Lindsay Graham and Graeme Smith are a few of the managers whose teams do not have any employment requiring further improvement and rather even have a few teammates who have exceeded expectations.



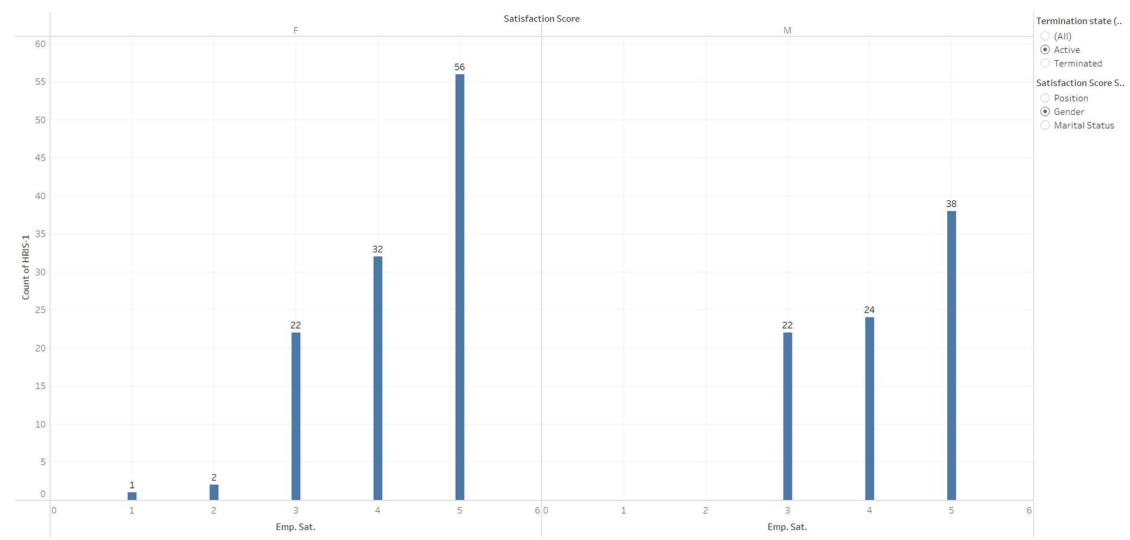
Observations:

- It can be seen that the average employee satisfaction per department is high.
- The age group of 20-30 have the least satisfaction being represented with an average satisfaction score of 3.57 with a count of 7.
- The most satisfied age group seems to be of 30-40 with an average satisfaction score of 4.3 with a count of 96.



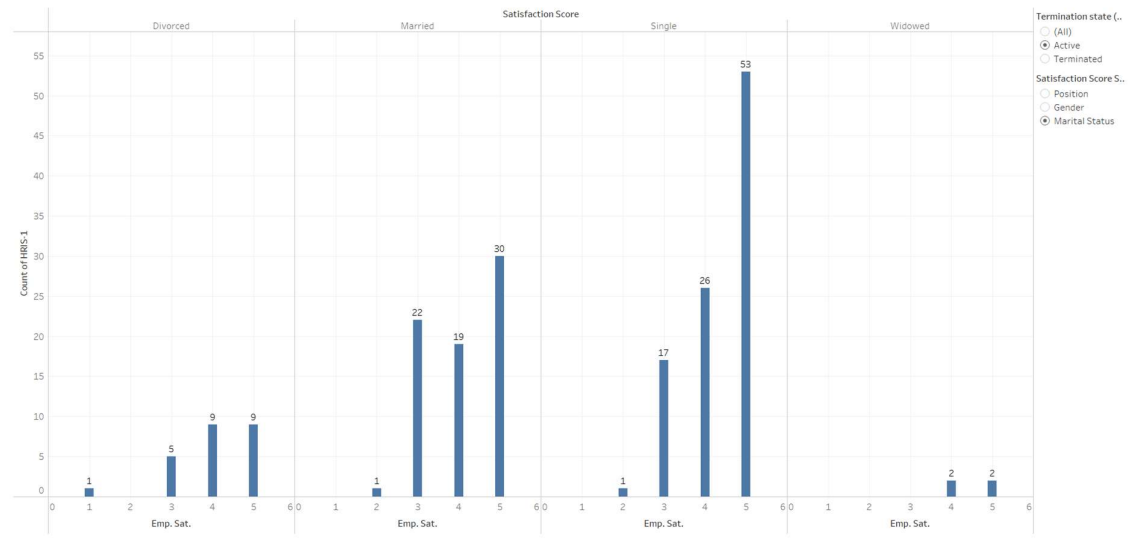
Observations:

- Based on the position, Employees have the highest satisfaction with 72 of them marking a satisfaction score of 5.
- Very few employees are dissatisfied as seen in the employee graph whereas less than half of the satisfied employees remained neutral giving a score of 3.
- Majority of the Middle management and Senior management are extremely satisfied whereas quite a few in the middle management remained neutral.



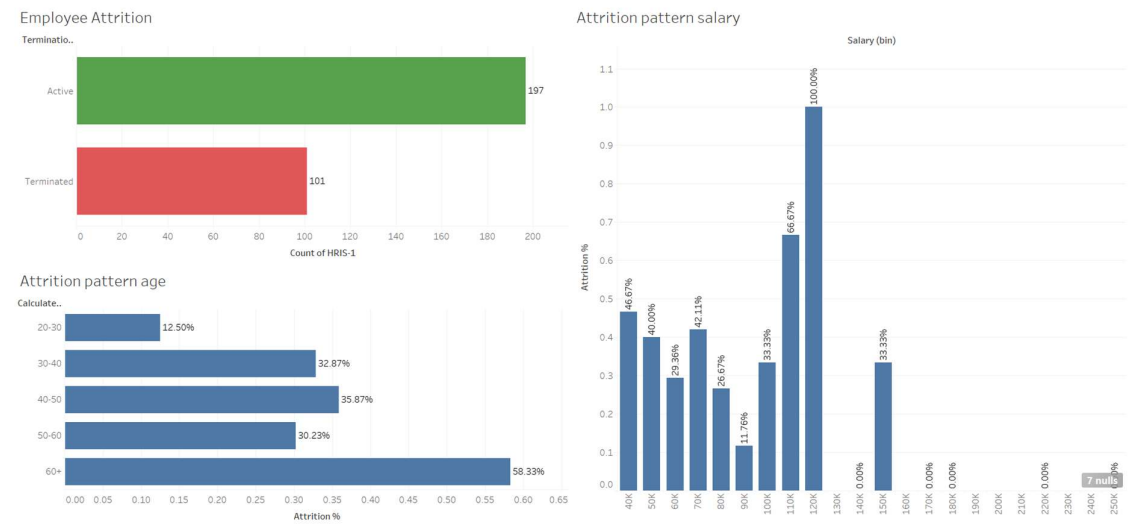
Observations:

- Based on the statistics both male and female employees are extremely satisfied whereas a good number of either groups have remained neutral and only 3 of the female employees have shown dissatisfaction.



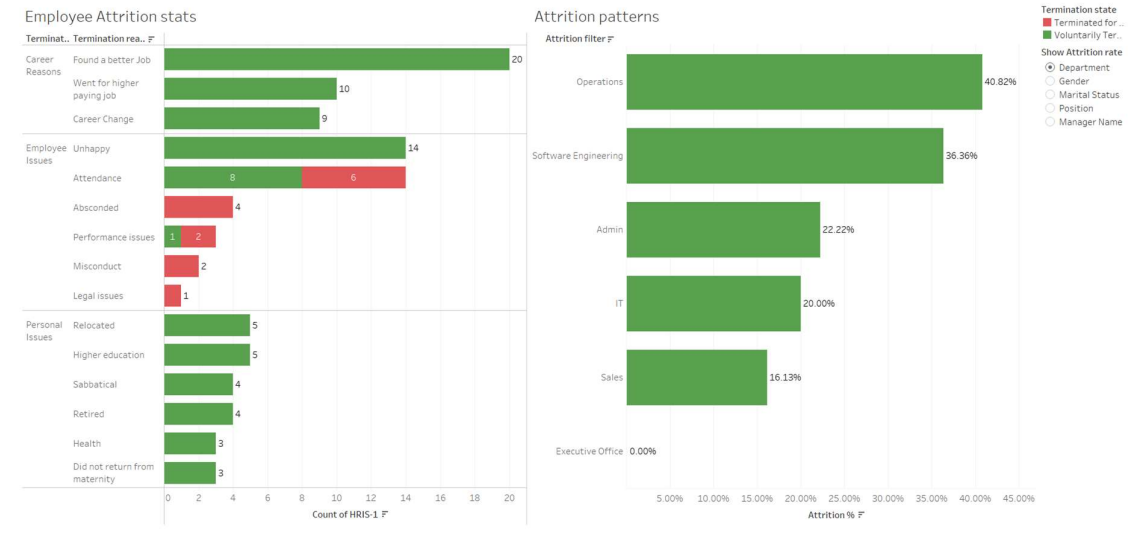
Observations:

- Single employees are the most satisfied followed by a good number of employees being decently satisfied.
- Less than 30 of the employees remain neutral towards employee satisfaction.
- There are a total of 4 employees which are dissatisfied 2 being single, 1 married and the remaining divorced.



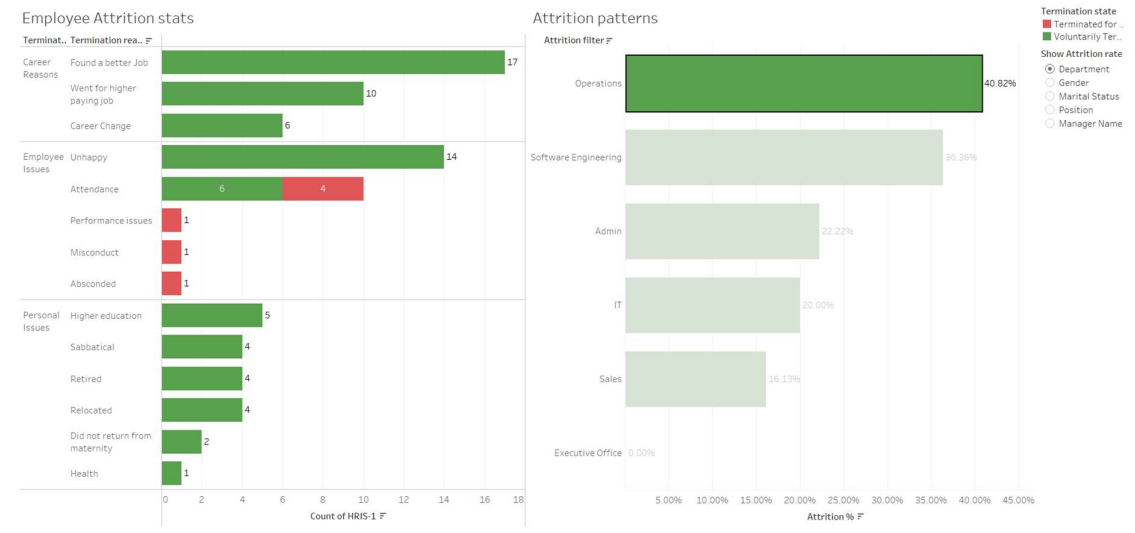
Observations:

- Till date there have been a total of 101 terminations and the current active employee count is at 197.
- More than half of the terminations are from the age group of 60+
- The least attrition rate is of the age group of 20-30 at a rate of 12.5%



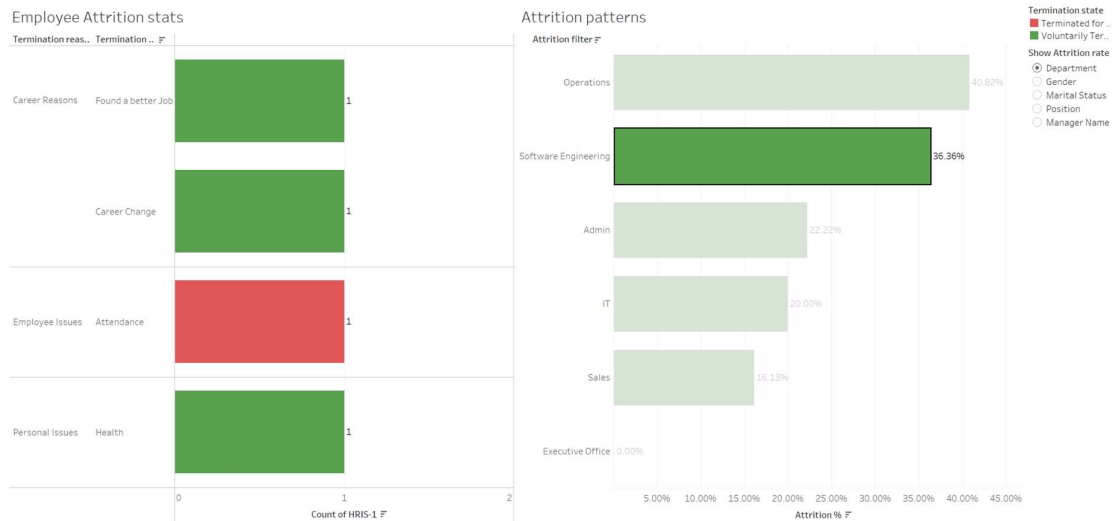
Observations:

- It can be seen that majority of the terminations were voluntary with maximum being caused due to Career or Employee reasons.
- The highest reason for attrition is due to the fact that the employee found a better job followed by unhappiness of the employee with the company.
- The highest attrition rate is from the Operations department at 40.82%
- The lowest attrition rate is from the Sales department excluding the Executive office.



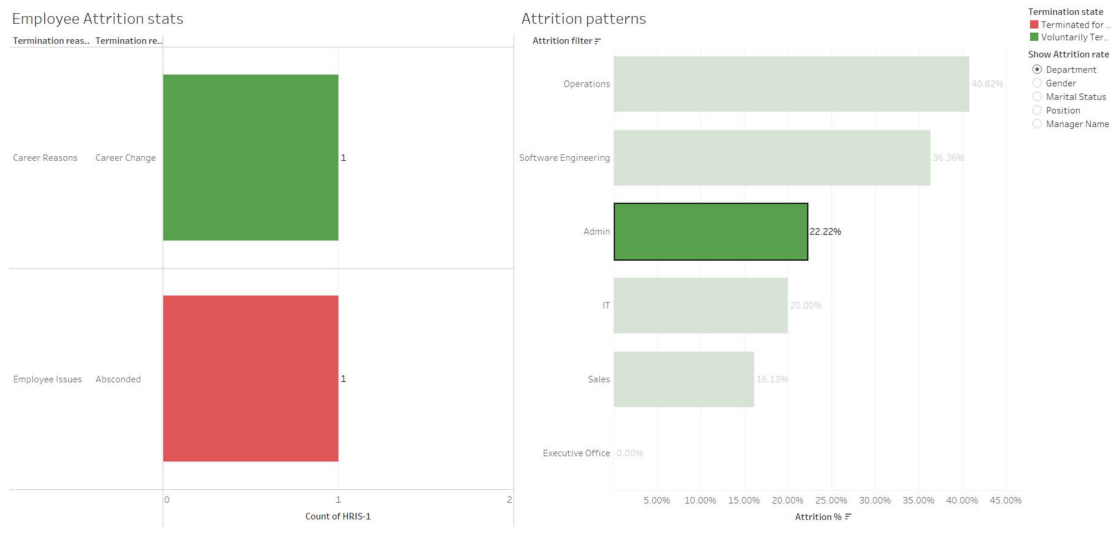
Observations:

- Major reason of attrition from the Operations department is due to the employee finding a better job or being unhappy.
- There have been cases of termination from the company's side on grounds of attendance, performance issues, misconduct and abscondment.
- A total of 33 terminations were due to Career reasons, 27 due to Employee Issues and 20 due to Personal reasons.



Observations:

- Software Engineering Department has the second highest attrition rate at 36.36%
- Only 4 terminations have taken place with 3 being voluntary and 1 being a termination for repeated absence.



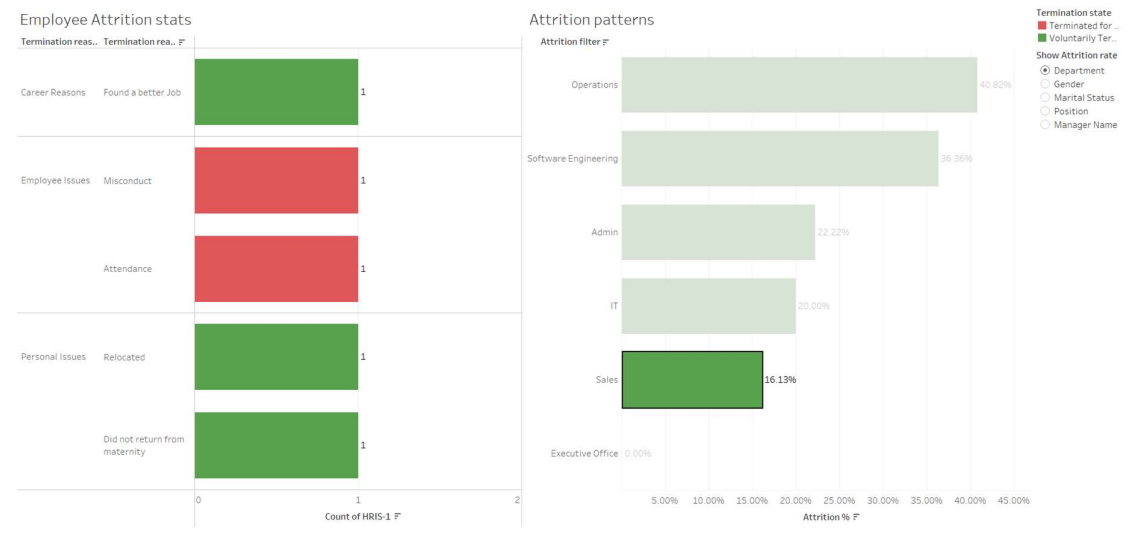
Observations:

- Admin department has only 2 terminations.



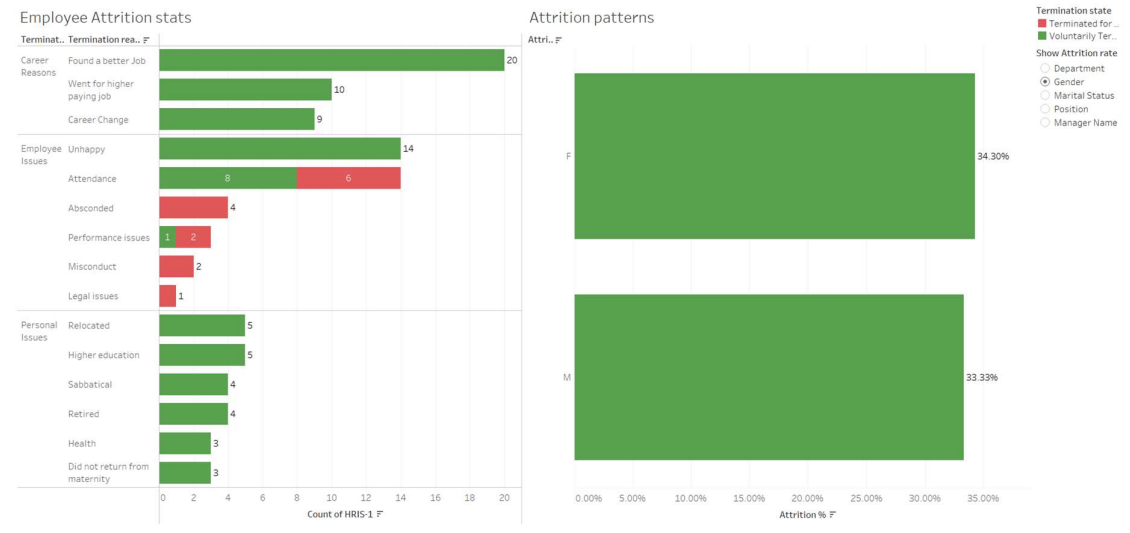
Observations:

- IT Department has a 20% attrition rate and has seen a total of 10 terminations with 4 being due to a cause while others were voluntary.



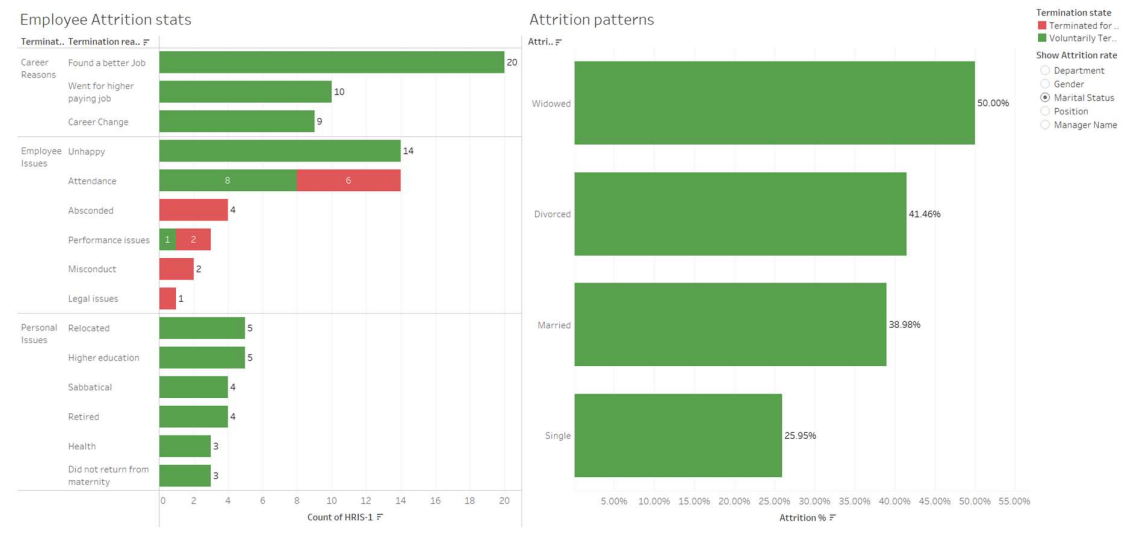
Observations:

- Admin department has a total of 5 terminations with 2 being due to a cause. Both the cases being due to employee issues.



Observations:

- Both the male and female employees have almost similar percentage of attrition.
- A total of 59 female employees have been terminated out of which 8 have been terminated on the grounds of employee issues by the company.
- A total of 42 male employees have been terminated out of which 7 have been terminated on the grounds of employee issues by the company.



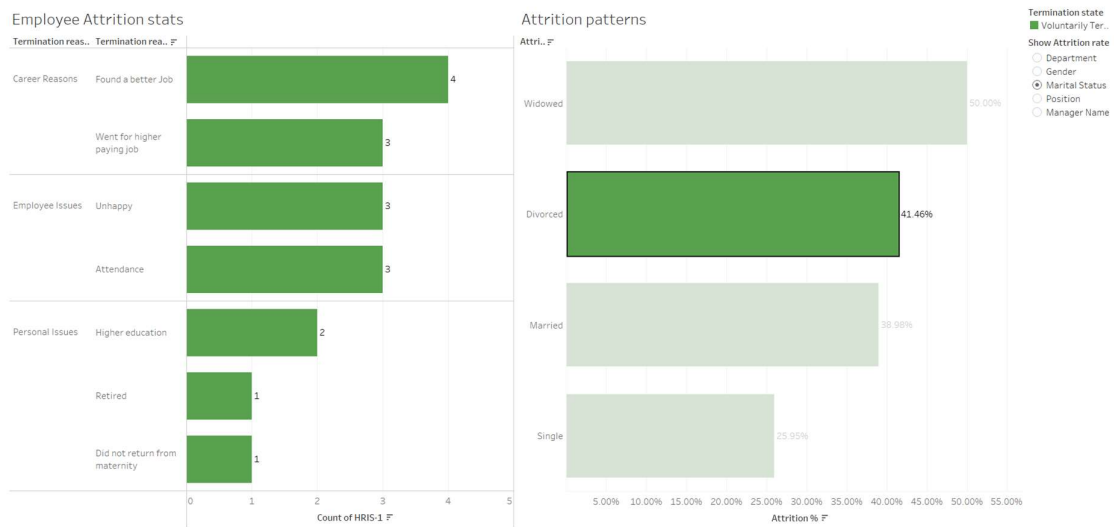
Observations:

- Almost half of the widowed employees have been terminated with the least terminations being in the single employee category.



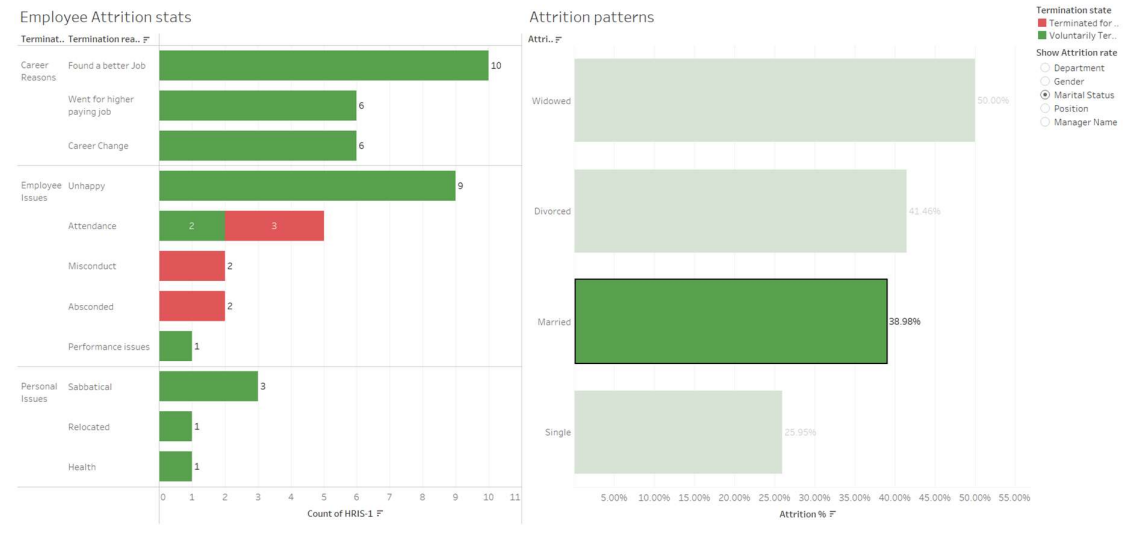
Observations:

- 4 widowed employees were terminated out of which 1 was terminated on grounds of absence by the company.



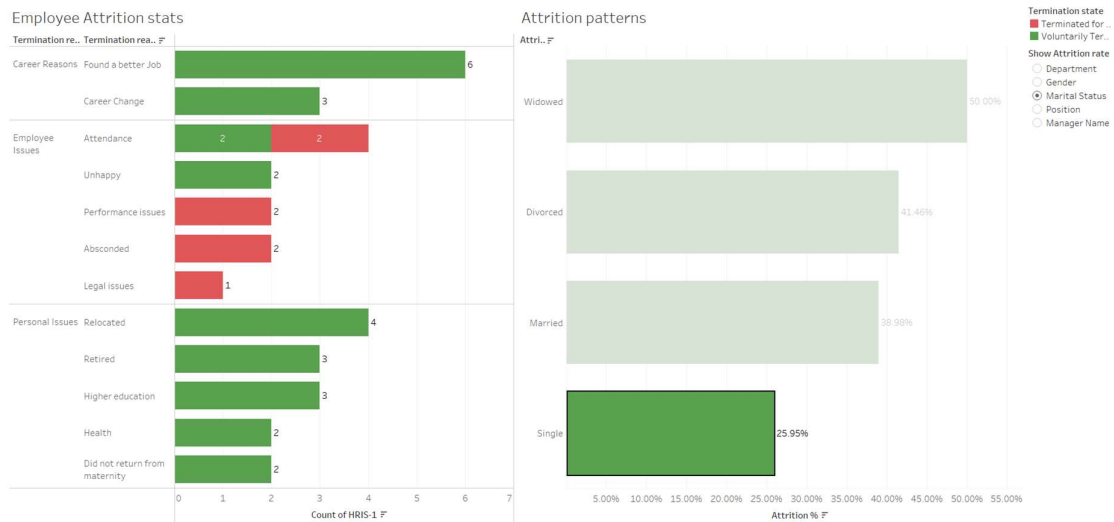
Observations:

- A total of 17 divorced employees were terminated but were all voluntary terminations.



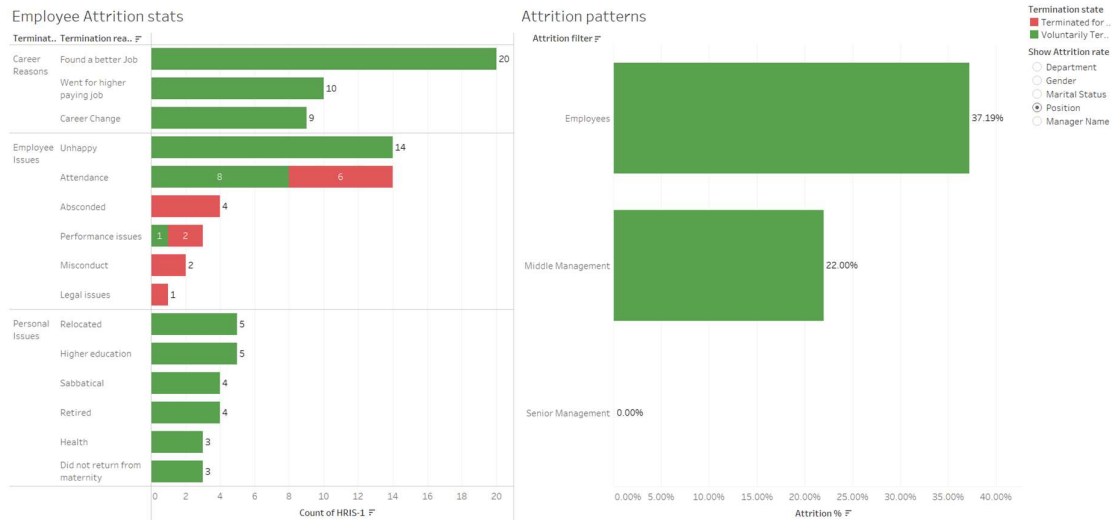
Observations:

- A total of 46 married employees were terminated out of which 7 were terminated due to employee reasons by the company.



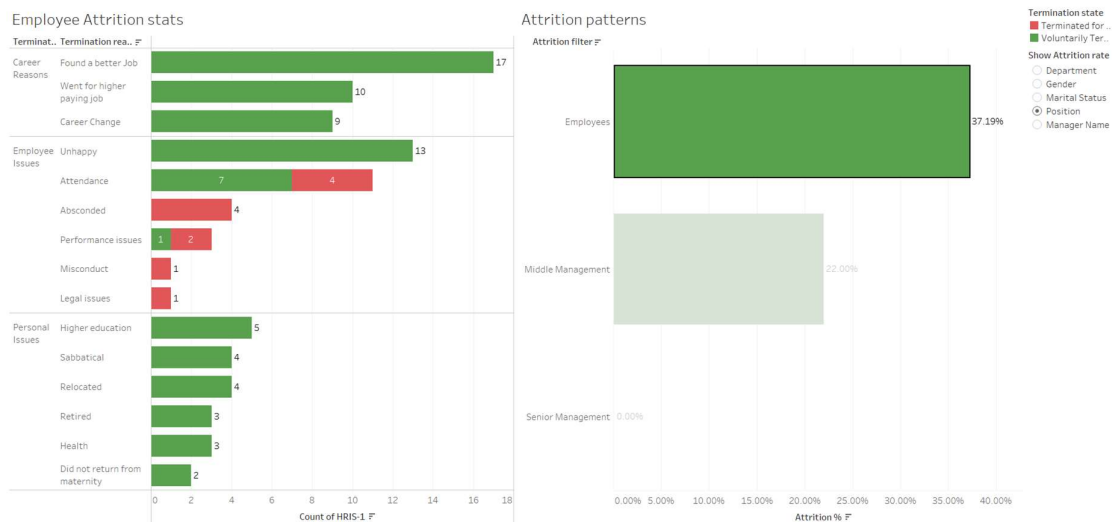
Observations:

- A total of 34 single employees were terminated out of which 7 were terminated due to employee reasons by the company.



Observations:

- *Employees have a higher attrition rate than the Middle Management.*



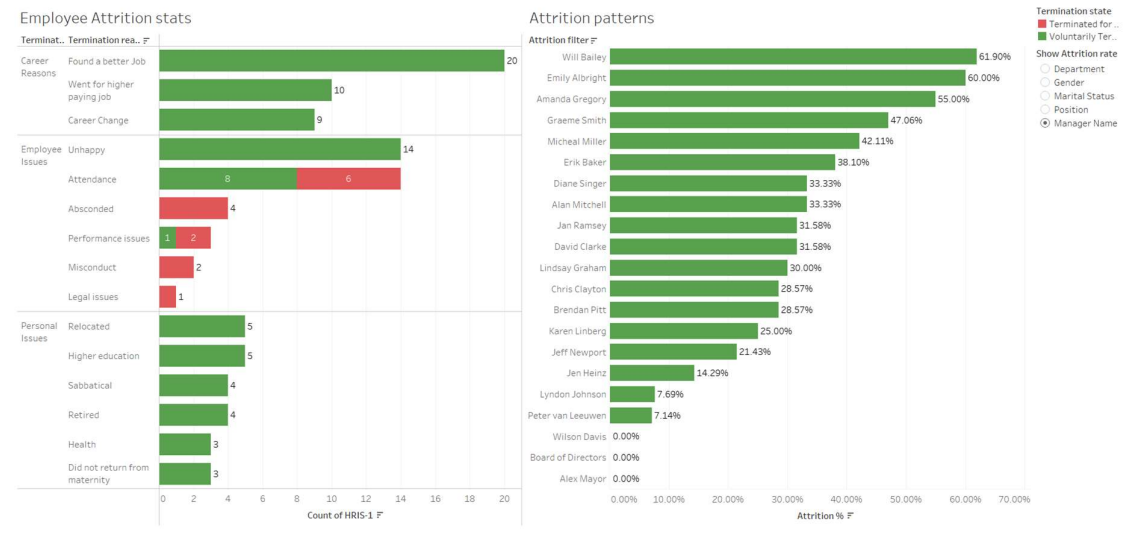
Observations:

- *A total of 86 employees have been terminated out of which 12 have been on the grounds of employee issues by the company.*



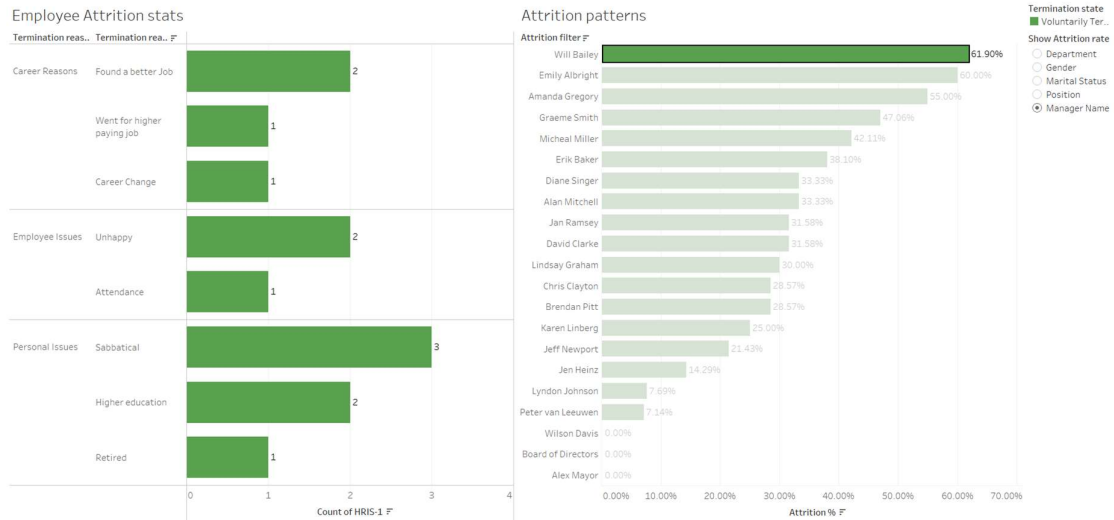
Observations:

- A total of 11 employees from the Middle Management have been terminated out of which 3 are due to employee issues by the company.



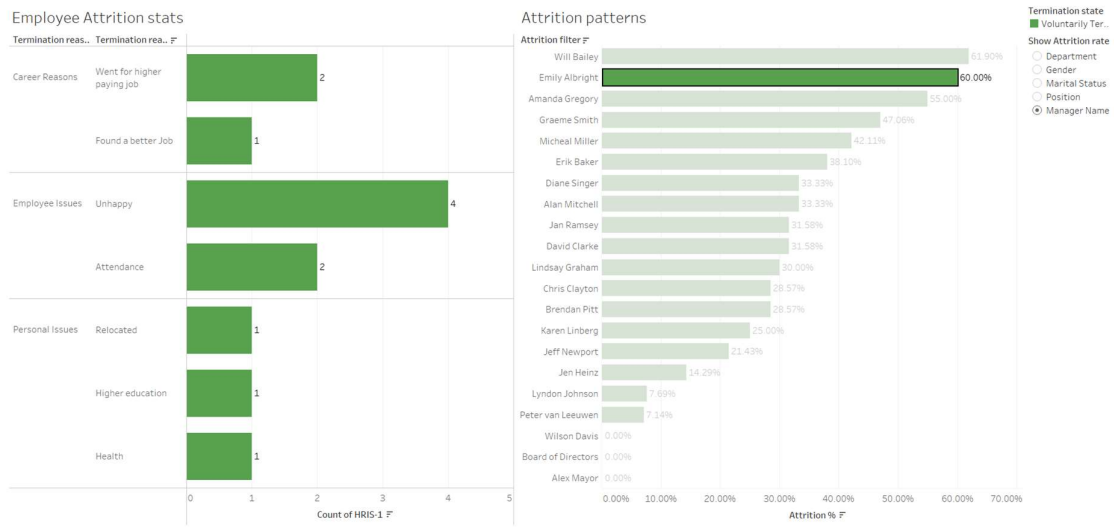
Observations:

- Employees under Mr. Will Bailey, Ms. Emily Albright and Ms. Amanda Gregory have the highest attrition rate.
- Employees under Mr. Wilson Davis, Mr. Alex Mayor and the Board of Directors have 0 attritions.



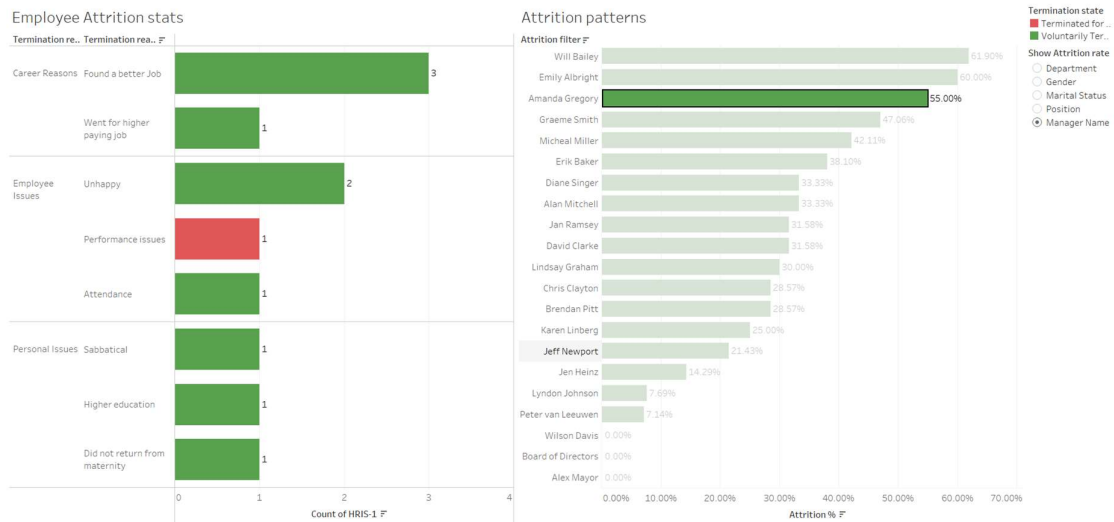
Observations:

- Terminated employees under Manager Will Bailey have been terminated due to voluntary reasons.
- The highest reason for attrition was sabbatical with 3 of the employees leaving voluntarily.
- 2 employees left voluntary due to unhappiness.



Observations:

- Terminated employees under Manager Emily Albright have been terminated due to voluntary reasons.
- The highest reason for attrition was Unhappiness with 4 of the employees leaving voluntarily.



Observations:

- Terminated employees under Manager Amanda Gregory have been terminated voluntarily except 1 done via the company due to performance issues of the employee.

Inferences at a glance

1. *The largest department is Operations with 116 employees, followed by IT, Sales, Admin, Software engineering and Executive office with 40, 26, 7, 7, and 1 employee respectively.*
2. *The age group with most number of employees is 30 – 40 years with 96 employees followed by 40 – 50 years, 50 – 60 years, 20 – 30 years and then finally > 60 years with 59, 30, 7 and 5 employees respectively.*
3. *The company has more females than male employees – 113 and 84 respectively.*
4. *Most of the employees are single – 97, followed by married, divorced, and widowed – 72, 24, and 4 respectively.*
5. *Among all departments excluding executive office, given it is the CEO, the department with average highest salary is IT and the department with the lowest average salary is Operations. However, in terms of the total salary expenses, Operations is on the top mainly because of the number of the employees in the department.*
6. *In terms of average salary, across all bins the salary levels were similar except the 20 – 30 years bucket and 60+. This is mostly because there are only few employees in the bucket. However, in terms of total expense, the highest expense is in the 30–40 years' category mainly because of the number of employees in the group.*
7. *More salary expense goes to the female gender mostly due to the number of female staffs. In terms of the average salary, the difference in the salary made by female staff in comparison with that of the male staff is about < \$2000.*
8. *It seems like the average salaries made by single and married employees were similar however the divorced employees made ~\$8000 lesser. This could possibly because this category has only few employees however given that there are 24 employees in this group, we cannot disregard the difference in average salary.*
9. *We see that most (155) employees met the expectations, while 27 employees exceeded the expectations and 15 employees did not meet the standards and had to improve their performance.*
10. *Since Software Engineering, Admin, and Executive office had only few employees, we may not be able to analyse the values properly. Among the large departments, Operations, IT and Sales, all 3 had > 75% meeting expectations, while sales had the highest number of staffs needing performance improvement.*
11. *There are few managers who had high % of staff meeting or exceeding expectations e.g., Karen Linberg, David Clarke, Erik Baker, Peter van Leeuwen, Alex Mayor, Chris Clayton. However, there are few managers on the opposite side e.g., Brendan Pitt, Michael Miller.*
12. *We see that a high % of female staffs met expectation compared to male staff (80.53% Vs 76.19%) and in only fewer female staffs needed performance improvement in comparison to male (5.31% Vs 10.71%).*

13. Since there are only few people in the categories divorced and widowed, we can only consider single and married to analyse. In term of exceeding performance, we see that single staffs exceeded performance compared to married (14.4% Vs 9.7%).
14. Performance distribution among the large teams look similar and we cannot analyse small teams.
15. We see that a large number of employees 94 are highly satisfied (5) and 56 employees are satisfied. Only 3 employees were dissatisfied.
16. IT department had highest average employee satisfaction among the large departments followed by operations.
17. Amanda Gregory had employees with the highest average satisfaction.
18. No difference between male and female staffs in terms of average employee satisfaction.
19. Excluding small groups, widowed and divorced, married staffs were less satisfied with the company compared to the single staffs (4.08 Vs 4.35).
20. 197 staffs are currently employed and 101 staffs have been terminated.
21. Career related reasons top the list followed by personnel issues. Among career reasons highest reason was that the employees found a better a job elsewhere.
22. For obvious reasons, terminated for a cause (non-voluntary) are seen only in employee issues. Attendance seems to be the top reason among the non-voluntary terminations.
23. Operations had the highest attrition (40%) followed by software engineering (36%). Even though IT is the second large department, it had only 20% attrition.
24. Will Bailey's team have had the highest attrition > 60%
25. There is a slight difference between the 30 – 40 Vs 40 – 50 years' categories. High attrition in 60+ is due to retirement.
26. We do not see noticeable difference in attrition between male and female staffs.
27. Among the large groups Married and Single, we see high attrition among married staffs compared to the single staff (39% Vs 26%).