# EMPLOYEE ATTRITION ANALYSIS REPORT

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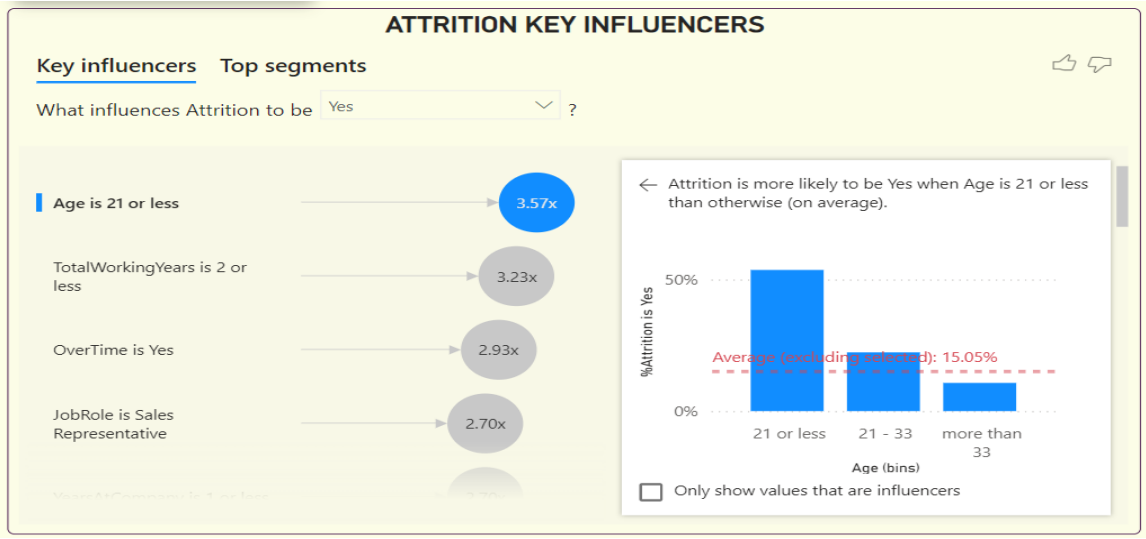
## EXECUTIVE SUMMARY

This report presents a comprehensive analysis of employee attrition for the company, identifies key potential factors contributing to employee attrition, and provides actionable recommendations to mitigate the issue. By leveraging the available dataset containing information on various employee attributes, the analysis delves into company performance assessment, payment structures, employee work experience, and employee feedback metrics to uncover patterns and trends that can inform strategic decisions to improve employee retention.

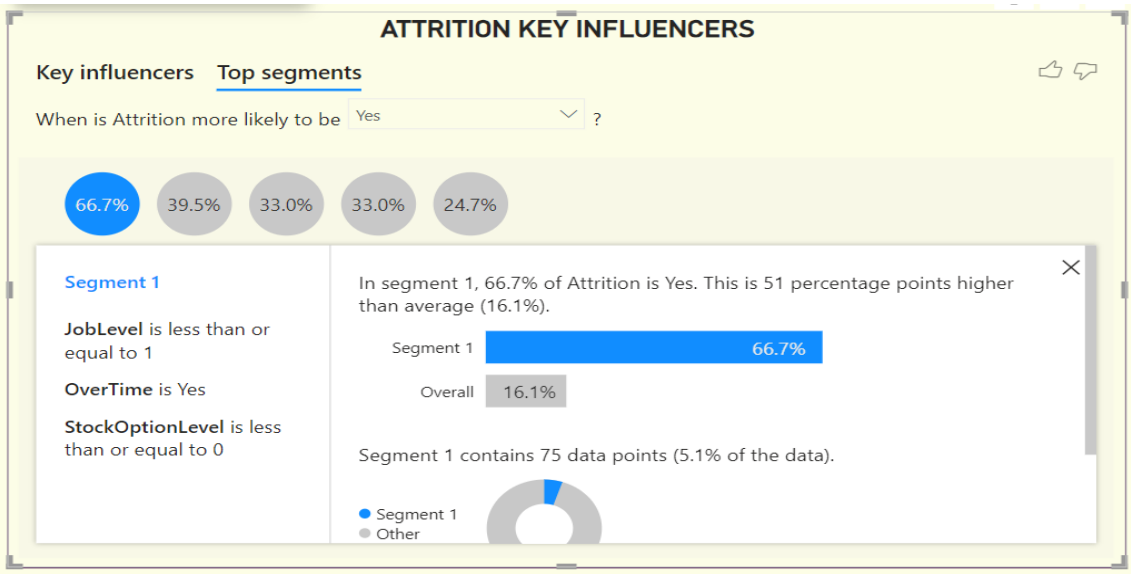
**Key Findings from the Analysis:**

- Significant Attrition Rate: The overall attrition rate is 16%, highlighting a critical need for focused retention efforts.
- Key Influencing Factors:
  - Age Factor: Employees aged 21 or less are 3.57 times more likely to leave the company compared to older age groups, with over 50% attrition observed in this group (*see the Visual chart below*).




  - Job Level and Workload: Employees at Job Level 1 working overtime and having no

stock options exhibit the highest attrition rate of 66.7% (*see the Visual chart below*).




- Job Role: Sales Representatives are 2.7 times more likely to leave than other roles.

- Low Job Satisfaction and Compensation: Employees with lower job satisfaction scores, limited salary hikes, and inadequate compensation are more likely to leave the organization.
- Career Development and Work-Life Balance: Limited career growth opportunities and poor work-life balance significantly impact retention.

**Recommendations:**

To mitigate these issues, the report recommends:

- Enhancing Compensation and Benefits to align with employee expectations, particularly for at-risk groups.
- Providing Career Development Pathways to support growth opportunities for entry-level employees and younger staff.
- Addressing Workload Imbalances by monitoring overtime and ensuring fair workload distribution.

- Implementing Targeted Retention Strategies for at-risk segments, such as younger employees, employees in Job Level 1, and those in roles like Sales Representatives.
- Improving Job Satisfaction and Work-Life Balance through programs like flexible work schedules and enhanced workplace support.

By implementing these recommendations, the organization can foster a more engaged and committed workforce, ultimately improving employee retention and organizational performance.

## INTRODUCTION

This report presents a comprehensive analysis of employee attrition for the company, identifies key potential factors contributing to employee attrition and provides actionable recommendations to mitigate the issue. By leveraging on the available dataset containing information on various employee attributes, this study seeks to uncover patterns and trends that can inform strategic decisions to improve employee retention.

It is worth noting that employee attrition is the condition where employees leave the company either voluntarily or involuntarily.

This analysis delves into various aspects of the company performance assessment and payment structure, employee work experience and the employee feedback metrics.

This report is meant for the company top management who are very comfortable studying the analysis and evaluation findings presented in table format.

## DATA SOURCE AND THE MOTIVATION FOR SELECTING THE DATASET

The dataset is from Kaggle website (Patel, 2017)

I am motivated to analyze the employee attrition dataset due to my previous experience as a Quality, Health, Safety, and Environmental (QHSE) management specialist. In my role as a quality management specialist, where I was responsible for ensuring that high-quality products and services were delivered to customers, I observed that employee attrition significantly impacts the quality of these outputs. Similarly, in my role as an HSE management specialist, where I had a duty of care towards employees, analyzing this attrition data will enhance my technical skills in understanding employee trends and needs. This analysis will help identify ways to better support employees, ultimately contributing to reducing the company's employee attrition rate.

## BUSINESS SKILLS DEVELOPMENT

The data analytics technical skills I have gained during the lecture will be applied to analyze the employee attrition dataset, further enhancing my proficiency in these skills. Upon completing this program, the skills I have acquired will enable me to analyze company employee records effectively, providing insights into key attributes that can be leveraged to reduce the attrition rate.

## DATA DESCRIPTION

The dataset contains 35 attributes in relation to the employees. The 35 columns and the description of the columns are detailed in the table below.

| s/n | Column name | Data description |
|---|---|---|
| 1 | Age | The age of the employee. The lowest age is 18 years old while the highest age is 60 years old. |
| 2 | Attrition | The attrition column is recorded as: Yes or No:<br>• 'Yes' signifies the employees who have left the company.<br>• 'No' signifies the employees who are still working with the company.<br>This is the main column of interest for the analysis |
| 3 | Business Travel | Classified into three based on the employees' business travel frequency:<br>• Travel Frequently<br>• Travel rarely<br>• Non-travel |
| 4 | Daily Rate | This daily rate of the employee salary. The lowest daily rate is 102 dollars while the highest daily rate is 1499 dollars. |
| 5 | Department | The department is classified into 3:<br>• Human Resources<br>• Research and development<br>• Sales |
| 6 | Distance From Home | The distance of the company to each of the employees' home address. The shortest home distance is 1 mile while the furthest home distance is 29 miles. |

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| 7 | Education | The employee education level is recorded as 1, 2, 3, 4 and 5.<br>• 1 stands for below College.<br>• 2 stands for College.<br>• 3 stands for Bachelor.<br>• 4 stands for Master.<br>• 5 stands for Doctor |
| 8 | Education Field | The education field of the employees. It is comprised of:<br>• Human Resources<br>• Life Sciences<br>• Marketing<br>• Medical<br>• Technical Degree<br>• Other |
| 9 | Employee Count | The employee count is recorded as 1 for all the 1470 employees. The employee count column is used to measure the number of times an employee has been recorded into the data table. |
| 10 | Employee Number | The employee number is the unique identifying key of numeric data type for the employees. There are 1470 unique employee numbers. |
| 11 | Environment Satisfaction | The employees' level of satisfaction with the environment.<br>• 1 stands for Low;<br>• 2 stands for Medium;<br>• 3 stands for High;<br>• 4 stands for Very High |
| 12 | Gender | The employees' gender is composed of: |

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| | | • Male<br>• Female. |
| 13 | Hourly Rate | This hourly rate of the employee salary. The lowest hourly rate is 30 dollars while the highest hourly rate is 100 dollars. |
| 14 | Job Involvement | The employee level of involvement with the job.<br>• 1 stands for Low;<br>• 2 stands for Medium;<br>• 3 stands for High;<br>• 4 stands for Very High |
| 15 | Job Level | The job level is classified as 0, 1, 2, 3, 4 and 5.<br>• 1 stands for Entry Level<br>• 2 stands for Intermediate Level<br>• 3 stands for Experienced Level<br>• 4 stands for Managerial Level<br>• 5 stands for Executive Level |
| 16 | Job Role | The job role is categorized into 8:<br>• Healthcare Representative<br>• Human Resources<br>• Laboratory Technician<br>• Manager<br>• Manufacturing Director<br>• Research Director<br>• Research Scientist<br>• Sales Executive<br>• Sales Representative |
| 17 | Job Satisfaction | The employee level of satisfaction with the job.<br>• 1 stands for Low; |

| | | |
|---|---|---|
| | | • 2 stands for Medium;<br>• 3 stands for High;<br>• 4 stands for Very High |
| 18 | Marital Status | The employee marital status. Composed of:<br>• Married<br>• Divorce<br>• Single |
| 19 | Monthly Income | The employee total monthly income, inclusive of overtime pay. The lowest monthly income is 1009 dollars while the highest monthly income is 19,999 dollars. |
| 20 | Monthly Rate | The employee monthly rate of the salary. The lowest monthly rate is 2094 dollars while the highest monthly rate is 26,999 dollars |
| 21 | Number of Companies Worked | The number of previous companies worked by the employees. The employee with the lowest number of company worked is zero while the highest number of company worked is 9 |
| 22 | Over 18? | Y means the age of all the employee is over 18 years old. All the employees are denoted as Y. |
| 23 | Overtime? | The Overtime column is recorded as Yes and No.<br>• 'Yes' signifies the employees who did overtime during the period being analyzed.<br>• 'No' signifies the employees who did not do any overtime during the period being analyzed. |
| 24 | Percent Salary Hike | The percentage of increase in the employee salary. The lowest percentage salary hike is 11% while the highest percentage salary hike is 25%. |
| 25 | Performance Rating | The Performance Rating level is recorded as 1, 2, 3 and 4.<br>• 1 stands for Low; |

| | | |
|---|---|---|
| | | • 2 stands for Good;<br>• 3 stands for Excellent;<br>• 4 stands for Outstanding |
| 26 | Relationship Satisfaction | The Relationship Satisfaction level is recorded as 1, 2, 3 and 4.<br>• 1 stands for Low;<br>• 2 stands for Medium;<br>• 3 stands for High;<br>• 4 stands for Very High |
| 27 | Standard Hours | The standard working hours is 80 hours for all the employees. |
| 28 | Stock Option Level | The employees' stock option level is classified into 0, 1, 2 and 3.<br>• 0 stands for not eligible<br>• 1 stands for limited stock grants eligibility<br>• 2 stands for significant stock grants eligibility<br>• 3 stands for advanced stock grant eligibility |
| 29 | Total Working Years | The employees total years of work experience, in integer. The lowest total working years is zero year while the highest total working year is 40 years. |
| 30 | Training Times Last Year | The number of training attended by the employees during the previous year. The lowest number of training times is zero while the highest number of training times is 6. |
| 31 | Work-Life Balance | The Relationship Satisfaction level is recorded as 1, 2, 3 and 4.<br>• 1 stands for Bad;<br>• 2 stands for Good; |

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| | | • 3 stands for Better;<br>• 4 stands for Best |
| 32 | Years At Company | The number of years the employee has worked at the company. The lowest value at the years at company variable is zero year while the highest value is 40 years. |
| 33 | Years In Current Role | The number of years the employee has worked in the current role. The lowest value in the years in current role variable is zero years while the highest value is 18 years. |
| 34 | Years Since Last Promotion | The number of years since the employee was last promoted. The lowest value in the years since last promotion variable is zero years while the highest value is 15 years. |
| 35 | Years With Current Manager | The number of years the employee has been working with their current manager. The lowest value in years with current manager is 0 year while the highest value is 17 years. |

The following columns were created from the initial columns in the dataset for the purpose of this analysis.

| S/N | Column name | Data description |
|---|---|---|
| 1 | JobID | Created to connect the DimJob dimension table to the FactEmployeeAttrition fact table. |
| 2 | WorkHistoryID | Created to connect the DimWorkHistory dimension table to the FactEmployeeAttrition fact table. |
| 3 | EducationID | Created to connect the DimEducation dimension table to the FactEmployeeAttrition fact table. |
| 4 | FeedbackID | Created to connect the DimFeedback dimension table to the FactEmployeeAttrition fact table. |

| | | |
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| 5 | PerformanceID | Created to connect the DimPerformance dimension table to the FactEmployeeAttrition fact table. |
| 6 | GroupedYearsat Company | Created to group the employees based on years at company column from range 0-9; 10-19; 20-29 and 30-40 years. |
| 7 | AgeBracket | Created to group the employees based on the age column from range 18-30, 31-40, 41-50 and 51-60 years. |
| 8 | GroupedTotal Working Years | Created to group the employees based on the total working years column in a specified range of years |
| 9 | TotalWorking Years Grouping Benchmark | Created with M language to serve as the benchmark / criteria for grouping the employees using the total working years variable. |
| 10 | MonthlyIncome_ MonthlyRate_Ratio | Description attached at the appendix, section C. |
| 11 | MeanMonthlyRate | Description attached at the appendix, section C. |
| 12 | Difference_MonthlyRate _MeanMonthlyRate | Description attached at the appendix, section C. |
| 13 | MeanMonthlyIncome | Description attached at the appendix, section C. |
| 14 | Difference_MonthlyIncome _MeanMonthlyIncome | Description attached at the appendix, section C. |
| 15 | Difference_MRate_ MeanMRate_Square | Description attached at the appendix, section C. |
| 16 | Diff_MRate_x_ Diff_MIncome | Description attached at the appendix, section C. |

## BUSINESS QUESTIONS AND BUSINESS KPI WITH FOCUS ON ATTRITION AS THE MAIN FEATURE

### BUSINESS KEY PERFORMANCE INDICATORS (KPIs)

The top management seeks data analytics insights from the dataset to identify programs that will support achieving the following business KPIs:

1. Reduce the employee attrition rate by 5% within the next year.
2. Increase employee job engagement by 5% within the next year.
3. Achieve a 5% improvement across the employee feedback metrics within the next year.
4. Increase employee job satisfaction by 10% within the next year.

### BUSINESS QUESTIONS

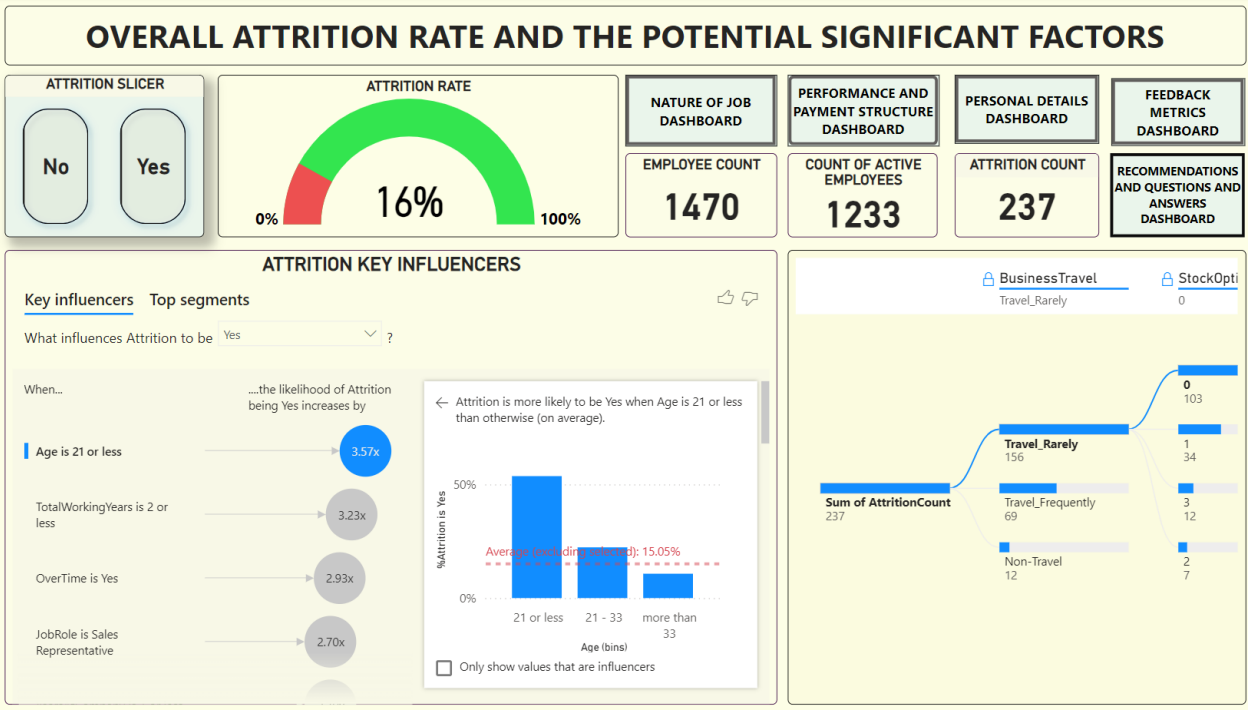
The following business questions have been raised by top management to guide the employee attrition data analysis and support achieving the company's business KPIs:

1. What is the overall attrition rate, and what are the key factors potentially contributing to overall attrition and the attrition rate?
2. What are the potential influences on attrition related to the nature of the employee's job?
    - Which departments have the highest and lowest employee attrition counts during the analyzed period?
    - Which department has the highest and lowest attrition rate during the analyzed period?
    - Which job level experiences the highest attrition?
    - What is the relationship between business travel requirements and attrition?
    - What is the relationship between employees' stock option levels and attrition?

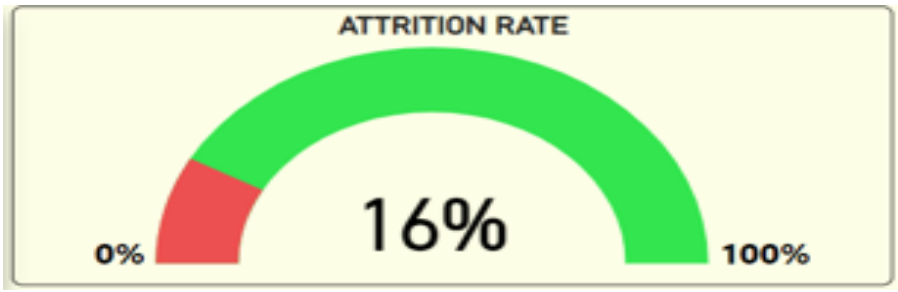
3. What are the potential impacts on attrition from performance assessment metrics and the payment structure?
    - What is the relationship between employees' monthly wages and the attrition rate?
    - What is the relationship between employees' performance ratings and attrition?
    - What is the relationship between employees' training times and attrition?
    - Is there a potential impact on attrition based on percentage salary hikes?
    - Is there a relationship between employees working overtime and attrition?
    - What is the relationship between employees' years of work experience and attrition?
4. What insights can be deduced from employee personal information, including their educational background and work history, that may influence the attrition rate?
    - What is the relationship between employees' age and attrition?
    - Is there a potential impact on attrition based on employees' number of years with the current manager, years in their current role, total years of working experience, and years at the company?
    - Is there a potential relationship between employees' home distance and attrition?
    - What is the relationship between employees' marital status and attrition?
    - Is there a potential relationship between employees' education field and education level with respect to attrition?
5. What insights can be obtained from employee feedback information regarding the attrition rate?
    - What is the relationship between employees' work-life balance levels, job satisfaction levels, environment satisfaction levels, and relationship satisfaction levels with attrition?
    - Is there any correlation between employees' job involvement and attrition?

## FINDINGS BASED ON ANALYSIS AND EVALUATION

**BUSINESS QUESTION 1:** WHAT IS THE OVERALL ATTRITION RATE AND SOME KEY FACTORS POTENTIALLY CONTRIBUTING TO THE OVERALL ATTRITION AND THE ATTRITION RATE?




**DESCRIPTION OF THE CHARTS FOR THE OVERALL ATTRITION RATE AND SOME KEY FACTORS POTENTIALLY CONTRIBUTING TO THE OVERALL ATTRITION AND THE ATTRITION RATE**

| | |
|---|---|
| **Visual** |   |
| **Justification** | • The Guage chart uses a gauge or speedometer visualization and are excellent for visually representing progress towards a target or the deterioration from a target.<br>• The Guage chart helps in highlighting the attrition level for immediate attention |

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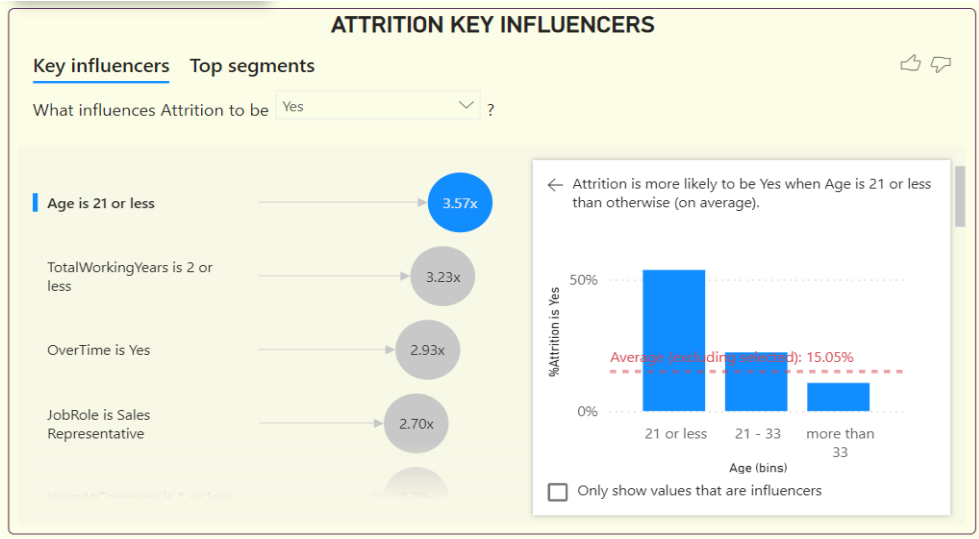
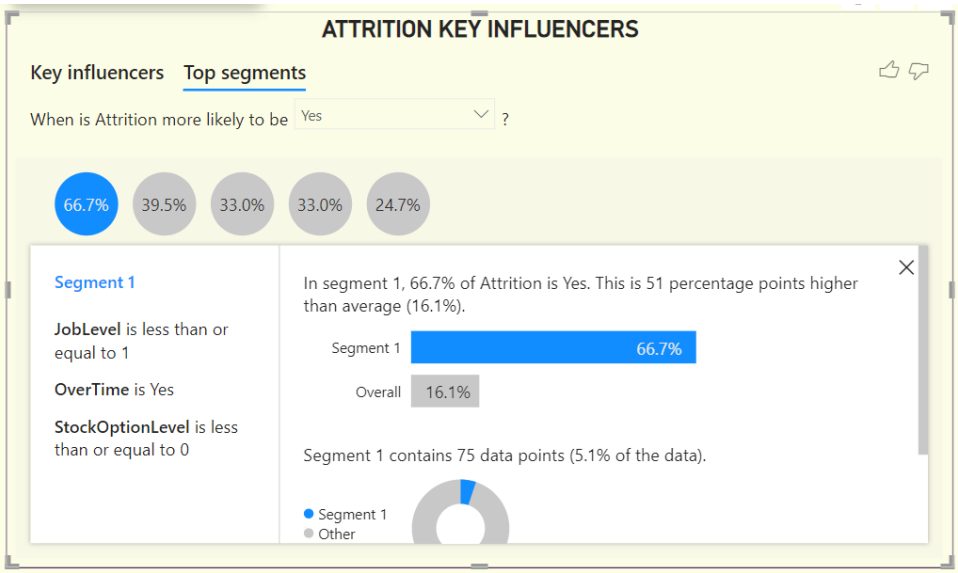
| | by using color coding as red for the percentage attrition level (attrition rate) and green for showing the level of the active employees with the company. |
| **Description of the Data** | • The chart shows the current attrition rate at 16% and the Guage range from 0% to 100%. |
| **Key findings** | • The current attrition rate is 16%. |
| | |
| **Visuals** |  |
| |  |
| **Justification** | The Key Influencer Visual is used because it identifies the most impactful factors driving a specific outcome—in this case, employee attrition. |

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| | • The "Key Influencers" section uses a ranked list and numerical multipliers to show the magnitude of influence of certain variables.<br>• The "Top Segments" section groups data into clusters, showing where attrition is most likely and how it compares to the overall average. |
| **Description of the Data** | Chart 1: Key Influencers Section<br>• This chart highlights key factors contributing to employee attrition. Each factor is ranked based on its likelihood to influence attrition, with multipliers indicating the strength of the influence.<br>• The bar chart on the right specifically focuses on age groups and their corresponding attrition rates.<br>• The bar chart for the other factors will also be displayed when the factors are clicked on, using the circle displaying the numerical multiplier.<br><br>Chart 2: Top Segments Section<br>• This chart identifies segments or combinations of attributes where attrition is significantly higher than average.<br>• Segment 1, for instance, is defined by Job Level is 1, Over Time is Yes, and Stock Option Level is 0. The segment 1 attrition rate is (67%) against the overall attrition rate (16%). |
| **Key findings** | Key Influencers Section (Chart 1)<br>• Top Influencing Factor:<br>➢ Employees aged 21 or less are 3.57 times more likely to leave the company compared to older age groups.<br>• Other Strong Influencers:<br>➢ Employees with 2 or fewer total working years (3.23x),<br>➢ Employees working Over-Time (2.93x), and<br>➢ Employees whose Job Role is "Sales Representative" (2.70x). |

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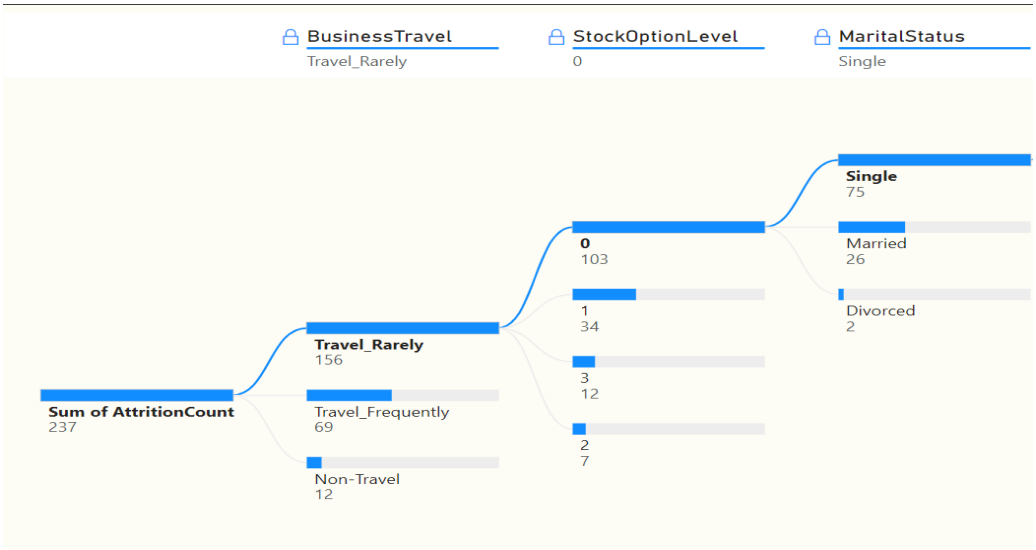
| | • Age-Specific Insight:<br>➢ The bar chart shows that attrition is highest for employees aged 21 or less (over 50%), which is significantly above the average attrition rate of 15.05% (marked by a red line) for the remaining age group.<br>Top Segments Section (Chart 2)<br>• Most At-Risk Segment (Segment 1):<br>➢ Employees with the following attributes experience the highest attrition rate (66.7%): Job Level is 1, the Over Time is Yes, and the Stock Option Level is 0.<br>➢ Segment 1 accounts for about 5% of the dataset (75 data points), which, although small, highlights a highly at-risk group. |
| | |
| **Visual for the key findings** |  |
| **Justification** | • Decomposition trees are well-suited for visualizing hierarchical data where a parent category is broken down into smaller subcategories. In this case, the tree effectively represents the breakdown of the total attrition count based on different factors like Business Travel, Stock Option Level, Marital Status.<br>• The tree-like structure provides a clear visual representation of the hierarchical relationships between different categories and their contribution to the overall attrition count. |

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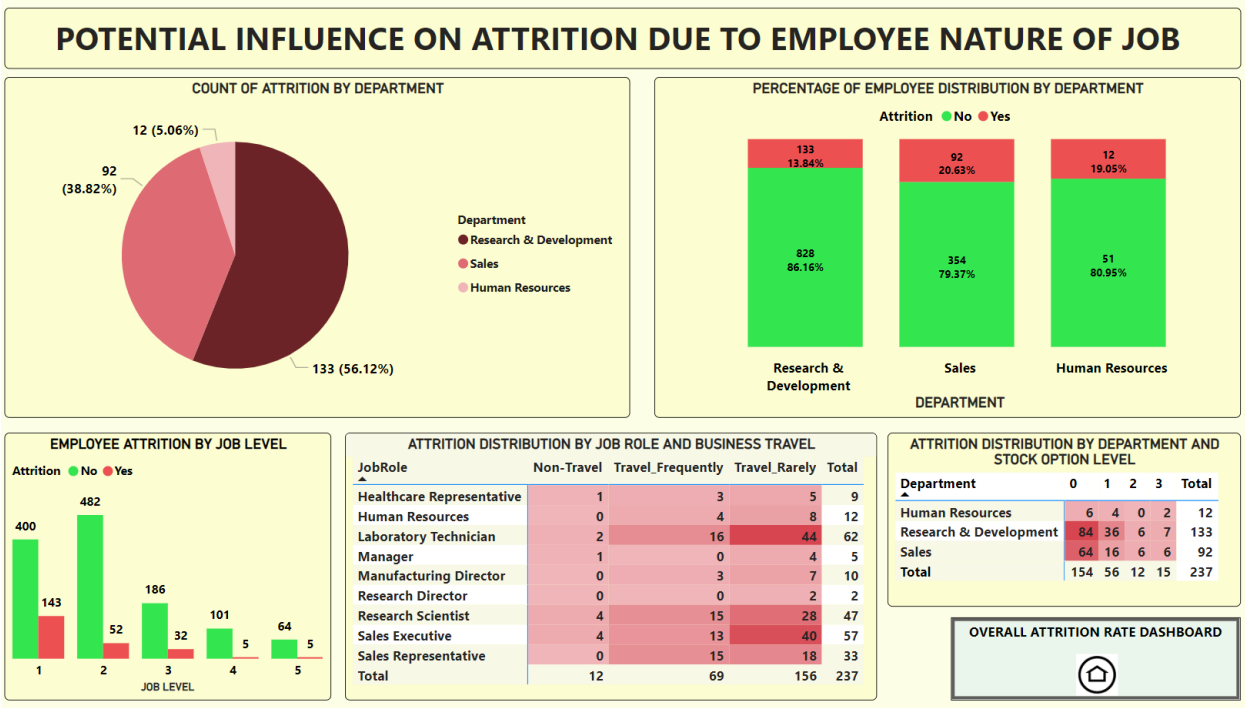
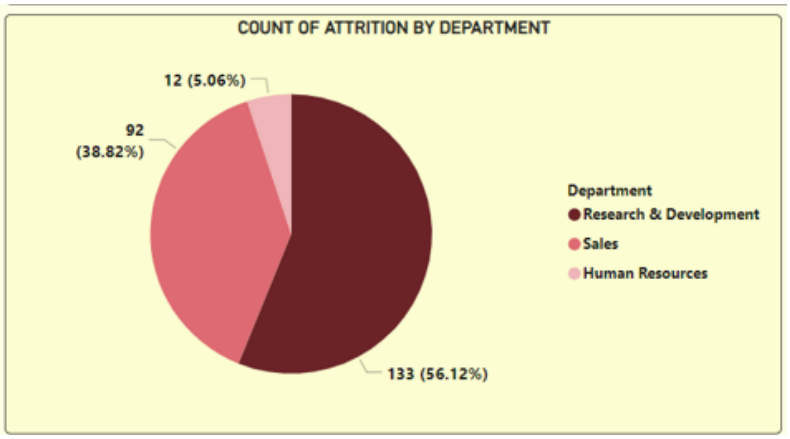
| | • The tree allows for easy exploration of the data by drilling down into different levels of detail, providing insights into the factors that contribute most significantly to attrition. |
| **Description of Data** | • The root node represents the "Sum of Attrition Count," indicating the total number of attrition cases.<br>• The root node branches out into three main categories: "Travel Rarely," "Travel Frequently," and "non-travel," representing different levels of business travel. The “Travel Rarely” factor is the most common factor among the employees who left the company, which indicates 156 employees among the employees who left travel rarely.<br>• The employees who left that rarely travel is further sub-categorized and the stock option level of zero and marital status classified as single are more prevalent compared to other factors.<br>• The leaf nodes represent the number of attrition cases within each specific combination of categories.<br>• The width of each branch and leaf node is proportional to the number of attrition cases it represents, providing a visual representation of the relative importance of each category. |
| **Key Findings** | • **"Travel Rarely"** has the highest number of attrition cases compared to "Travel Frequently" and "Non-Travel."<br>• Within "Travel Rarely," employees with "Stock Option Level of zero" and "Single" marital status appear to have higher attrition counts. |

**BUSINESS QUESTION 2:** WHAT ARE THE POTENTIAL INFLUENCES ON THE ATTRITION THAT ARE DUE TO THE EMPLOYEE NATURE OF JOB?




**DESCRIPTION OF THE CHARTS FOR THE POTENTIAL INFLUENCE ON ATTRITION DUE TO THE EMPLOYEE NATURE OF JOB**

| | |
|---|---|
| **Visual** |   |
| **Justification** | • Pie charts are good for showing proportional distribution. The pie chart above shows the proportion of the employees who have left each of the departments, making it easier to compare. |

| | |
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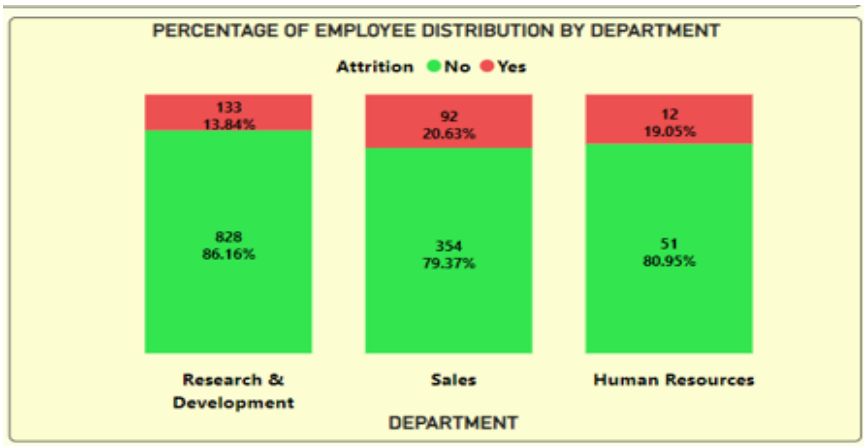
| **Description of the Data** | (Count of attrition by department)<br>• 133 employees (56.12%) left the Research & Development department, 92 employees (38.82%) left the Sales department while 12 employees (5.06%) left the Human Resources department. |
| **Key findings** | • The highest attrition count (133 employees) is in the Research & Development department, indicating retention issues while the lowest attrition count (12 employees) is in the Human Resources department. |
| | |
| **Visual** |  |
| **Justification** | • 100% stacked column charts are an excellent visualization tool when the goal is to compare proportions or relative distributions across multiple categories. 100% stacked column charts allow for a clear comparison of how individual segments (categories or groups) contribute to a whole, normalized to 100%.<br>• The 100% stacked column charts effectively compare total employees in each department, split into those who stayed and those who left, providing insight into attrition percentages relative to department size. |
| **Description of Data** | (Percentage of attrition distribution per department relative to the size of the department)<br>• 20.63% of the employees in the Sales department left the company, 19.05% of the employees in the Human Resources department left the |

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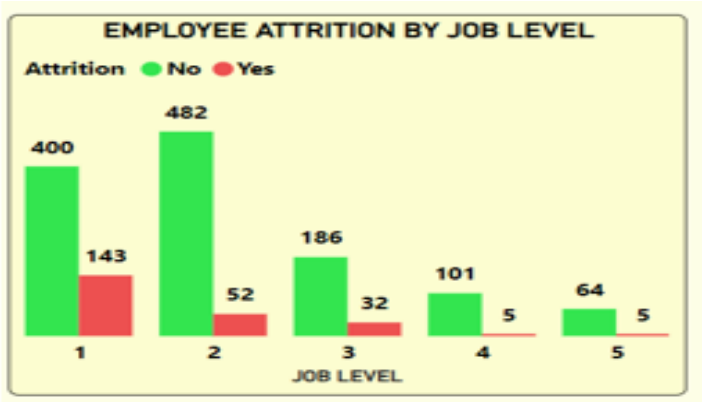
| | company while 13.84% of the employees in the Research and |
| **Key Findings** | • The sales department has the highest attrition rate at 20.63% despite having fewer employees (446 employees) than the Research and Development department (961 employees).<br>• The attrition count in the Human Resources department is the lowest, however, it has the second attrition rate at 19.05% due to its relatively small workforce (63 employees). |
| | |
| **Visual for the key findings** |  |
| **Justification** | • Clustered column charts are a powerful and intuitive visualization tool for comparing multiple categories side by side across varying dimensions<br>• The clustered column chart was effective in identifying attrition patterns across the job levels. |
| **Description of Data** | (Employee Attrition by Job Level)<br>The clustered column chart above shows the number of employees who stayed (green) and left (red) across five job levels:<br>• Job Level 1 has the highest attrition count (143 people left) while 400 people stayed.<br>• Attrition decreases significantly at higher job levels. |
| **Key Findings** | • Attrition is most prevalent at Job Level 1, indicating dissatisfaction or |

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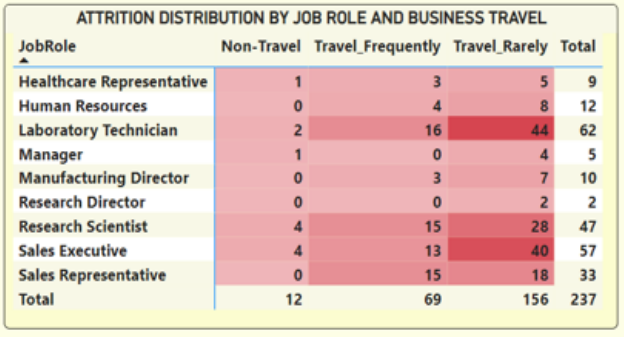
| | lack of growth at entry-level positions.<br>• Higher job levels (4 and 5) have much lower attrition counts and lower attrition rates. |
| | |
| **Visual for the key findings** | ATTRITION DISTRIBUTION BY JOB ROLE AND BUSINESS TRAVEL<br>  |
| **Justification** | • Matrix charts are useful for visualizing the interaction of categorical data and identifying variable intensity patterns across the categorical data.<br>• The matrix chart above shows the attrition intensity pattern across both the job roles and travel frequency. |
| **Description of Data** | (Attrition Distribution by Job Role and Business Travel)<br>• The Matrix chart shows the attrition counts for job roles across travel frequencies (Non-Travel, Travel Frequently, Travel Rarely).<br>• The attrition count is higher among the employees who travel rarely (156 employees left) compared to the employees who travel frequently (69 employees left) and the employees who do not travel (12 employees left)<br>• Laboratory technicians (62 employees left), Sales Executive (57 employees left), research scientist (47 employees left) and sales representative (33 employees left) are the job roles with relatively high attrition counts.<br>• Laboratory technicians (44 employees left) and sales executive (40 employees left) have relatively high attrition counts among the |

| JobRole | Non-Travel | Travel_Frequently | Travel_Rarely | Total |
|---|---|---|---|---|
| Healthcare Representative | 1 | 3 | 5 | 9 |
| Human Resources | 0 | 4 | 8 | 12 |
| Laboratory Technician | 2 | 16 | 44 | 62 |
| Manager | 1 | 0 | 4 | 5 |
| Manufacturing Director | 0 | 3 | 7 | 10 |
| Research Director | 0 | 0 | 2 | 2 |
| Research Scientist | 4 | 15 | 28 | 47 |
| Sales Executive | 4 | 13 | 40 | 57 |
| Sales Representative | 0 | 15 | 18 | 33 |
| Total | 12 | 69 | 156 | 237 |

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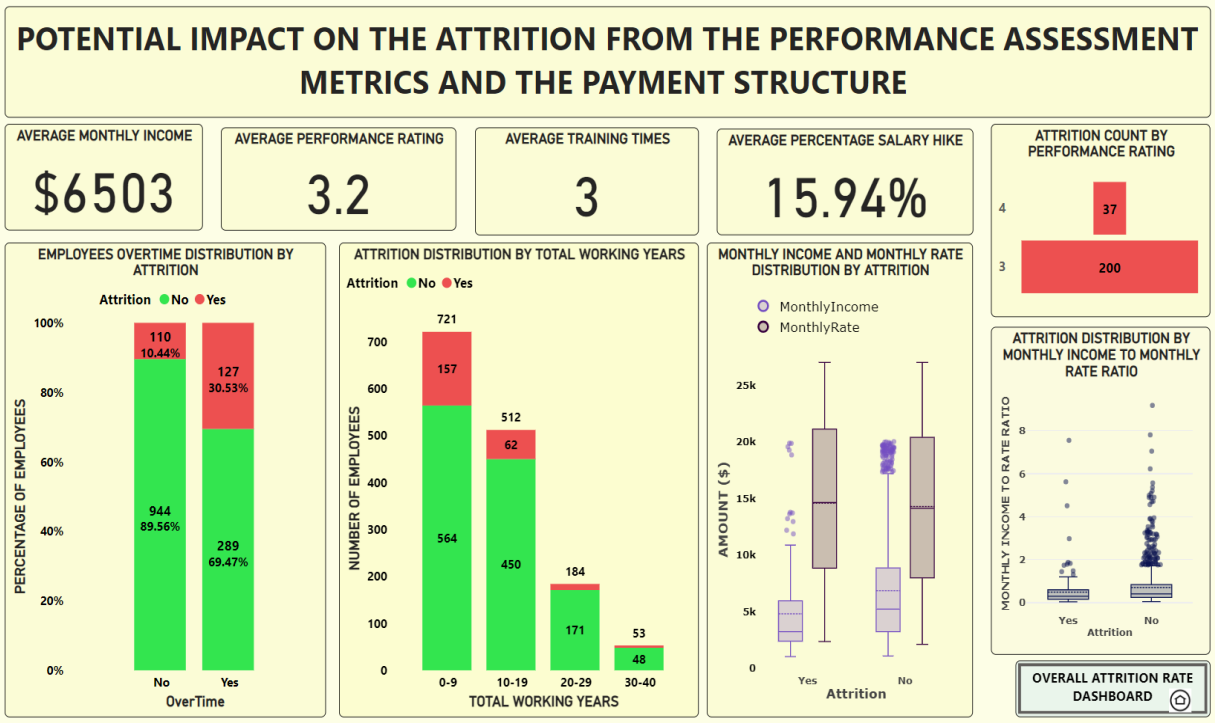
|---|---|
| | employees who left that travel rarely. |
| **Key Findings** | • Employees who travel rarely are more likely to leave, particularly in roles like Sales Executives, Laboratory Technicians and research scientists.<br>• Non-travel roles generally have lower attrition counts. |
| | |
| | ATTRITION DISTRIBUTION BY DEPARTMENT AND STOCK OPTION LEVEL<br>Department \| 0 \| 1 \| 2 \| 3 \| Total<br>Human Resources \| 6 \| 4 \| 0 \| 2 \| 12<br>Research & Development \| 84 \| 36 \| 6 \| 7 \| 133<br>Sales \| 64 \| 16 \| 6 \| 6 \| 92<br>Total \| 154 \| 56 \| 12 \| 15 \| 237 |
| **Justification** | The matrix chart above shows the attrition intensity pattern across both the department and the stock option level. |
| **Description of Data** | (Attrition Distribution by Department and Stock Option Level)<br>• Shows the attrition counts across stock option levels (0–3) for each department.<br>• Stock Option Level 0 sees the highest attrition, particularly in the Research & Development department (84 employees left) and Sales department (64 employees left). |
| **Key Findings** | • Employees with no stock options (Level 0) are most prone to attrition, especially in the Research & Development department and Sales department.<br>• Stock options appear to significantly impact employee retention. |

**BUSINESS QUESTION 3:** WHAT ARE THE POTENTIAL IMPACTS ON THE ATTRITION FROM THE PERFORMANCE ASSESSMENT METRICS AND THE PAYMENT STRUCTURE?




**DESCRIPTION OF THE CHARTS FOR THE POTENTIAL IMPACT ON THE ATTRITION FROM THE PERFORMANCE ASSESSMENT METRICS AND THE PAYMENT STRUCTURE**

| | |
|---|---|
| **Visuals** | **CARD VISUALS WITHOUT ANY SLICER EFFECT** |
| |   |
| | **CARD VISUALS WITH SLICER FOR ATTRITION SET AS 'YES'** |
| |   |
| | **CARD VISUALS WITH SLICER FOR ATTRITION SET AS 'NO'** |
| |   |
| **Justification** | • Card visuals provide a quick overview of key metrics. |

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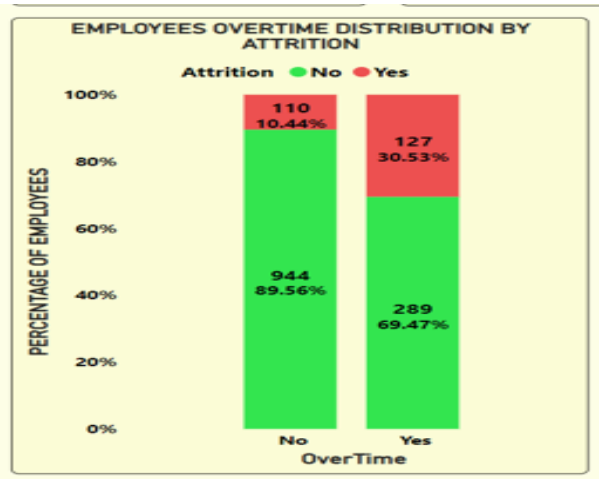
| | • The card visuals above provide a quick overview of key metrics, giving immediate insights into how pay, performance, training, and salary hikes relate to the attrition. |
| **Description of the Data** | • The cards above show the mean monthly income of employees, an aggregate score reflecting employee productivity (performance rating), the average number of training times by the employees, and the mean percentage increase in salary given to employees.<br>• The cards show the values without any slicer, with slicer for attrition condition as yes, and with slicer for attrition condition set as no. |
| **Key findings** | • Employees who left ("Yes") have a lower average monthly income ($4,787) than the overall employees ($6,503) and the active employees ($6,833), suggesting income dissatisfaction.<br>• All the groups have similar performance ratings (3.2) and training times (3), indicating these metrics are not strong drivers of attrition.<br>• Employees who left receive slightly lower salary hikes (15.50%) compared to the overall average salary hike (15.94%) and the active employees average salary hike (15.85%), which could hint at dissatisfaction. |
| | |
| **Visual** |  |

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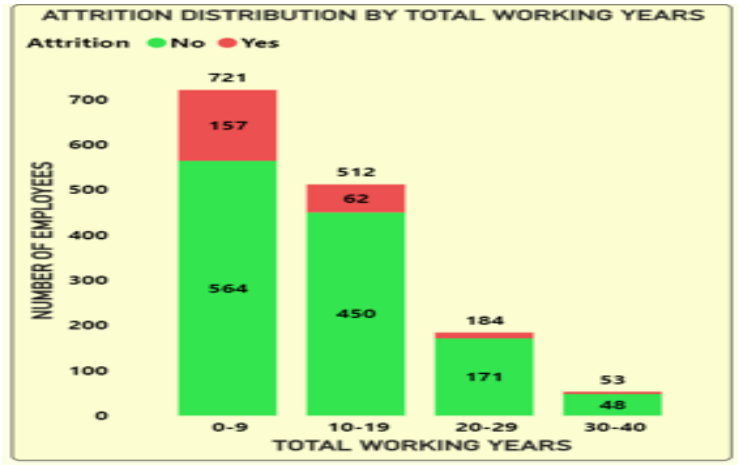
| **Justification** | (Overtime Distribution by Attrition)<br>• The 100% stacked column chart reveals whether employees who work overtime are more likely to leave, highlighting the workload-related attrition factors. |
| **Description of Data** | • It compares the proportion of employees who work overtime and their respective attrition rates, categorized into "Yes" (employees who left) and "No" (active employees). |
| **Key Findings** | • Employees working overtime show a significantly higher attrition rate (30.53%) compared to those who do not work overtime (10.44%). This indicates that excessive work hours contribute to higher attrition. |
| | |
| **Visual** |  |
| **Justification** | (Attrition by Total Working Years)<br>• The stacked column chart analyzes attrition across experience brackets, helping to identify which career stage has the highest turnover rates. |
| **Description of Data** | • The total number of employees leaving is shown across different working year categories: 0-9, 10-19, 20-29, and 30-40 years, to indicate different career stages. |
| **Key Findings** | • Attrition is highest among employees with 0-9 years of experience (157), while it decreases significantly for those with 10+ years. Early- |

| | |
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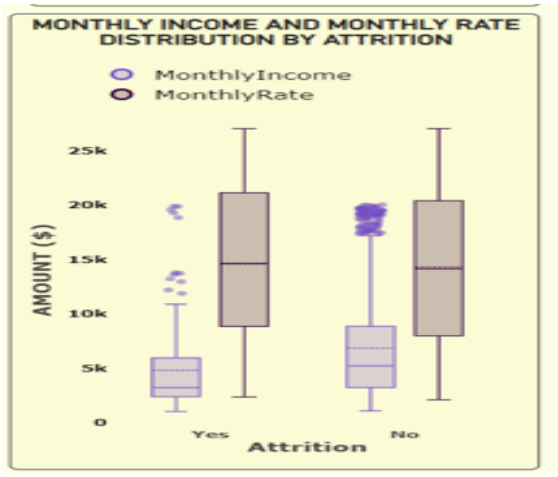
| | career employees may feel dissatisfied with growth or opportunities. |
| | |
| **Visual** |  |
| **Justification** | (Monthly Income and Monthly Rate Distribution by Attrition)<br>• The box and whisker with points chart is a quick way to show the distribution of the 2 quantitative variables and determine the statistical difference / similarities between quantitative variables.<br>• The box and whisker with points chart identifies income disparities and variability between the employees who left and active employees, highlighting financial dissatisfaction. |
| **Description of Data** | • It displays the spread of monthly incomes and monthly rates for employees grouped into "Yes" (employees who left) and "No" (active) categories. |
| **Key Findings** | • Despite the almost symmetrical distribution of the monthly rate for the employees who left and the active employees, there is significant difference in the monthly income distribution for the 2 categories (employees who left and the active employees). This shows financial dissatisfaction is a likely factor. |
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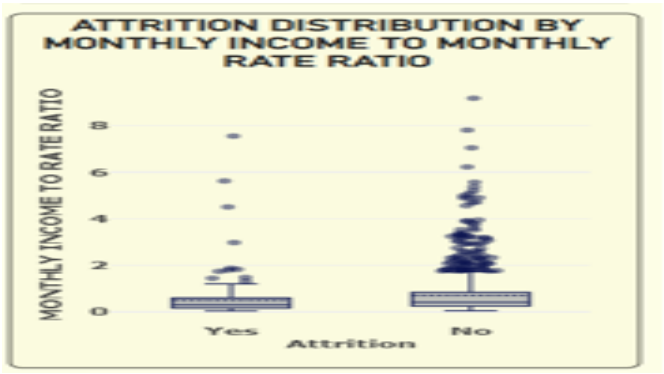
| **Visual** |  |
| **Justification** | • Box and whisker plot charts are appropriate for showing the distribution of the monthly income to monthly rate ratio, which effectively displays the range (minimum to maximum), interquartile range, median, and any outliers for both the active employees (No) and the employees who left (Yes) categories. |
| **Description of Data** | • The chart shows the distribution of the "Monthly Income to Monthly Rate Ratio" for two attrition groups:<br>➢ "Yes" represents employees who have left.<br>➢ "No" represents employees who have stayed.<br>• The y-axis represents the ratio, and the x-axis categorizes the data into "Yes" and "No." |
| **Key Findings** | • The active employees generally have a higher monthly income to monthly rate ratio compared to the employees who left.<br>• Outliers exist in both groups, but they are more concentrated in the "No" group, with a few extreme values reaching above 6 and 8.<br>• This suggests that higher income-to-rate ratios may correlate with employees staying longer in the company, while those with lower ratios may be more likely to leave. |
| | |

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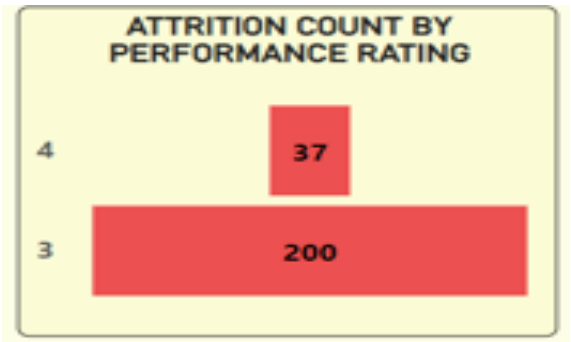
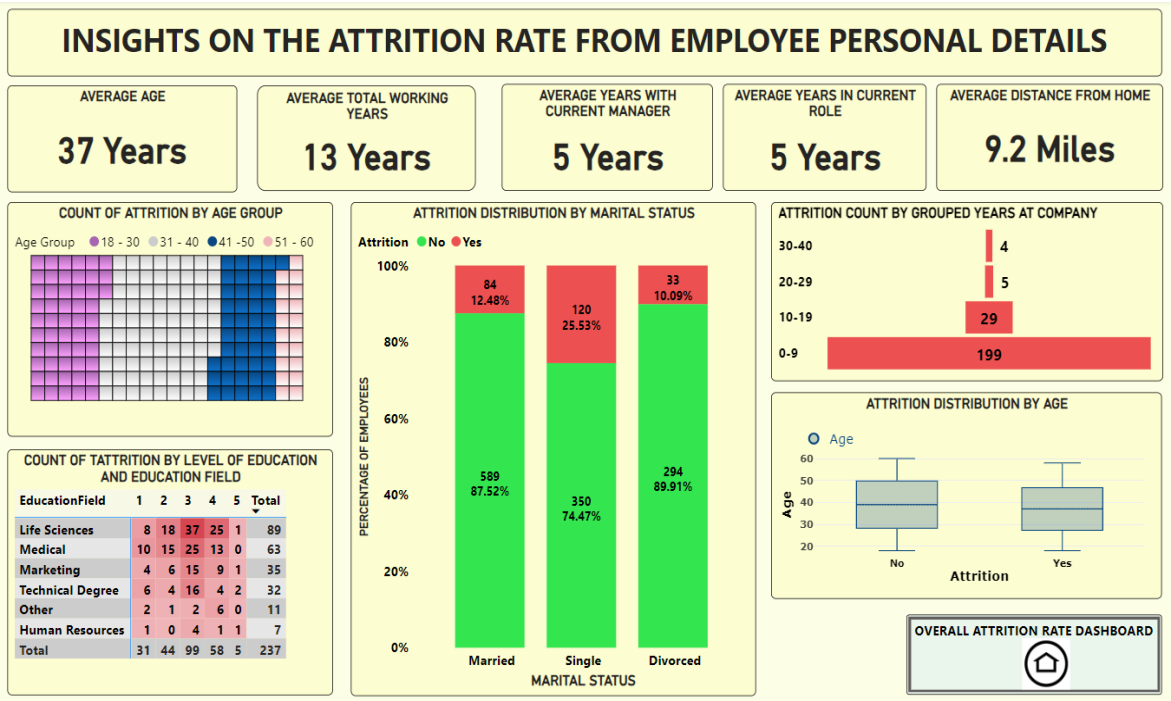
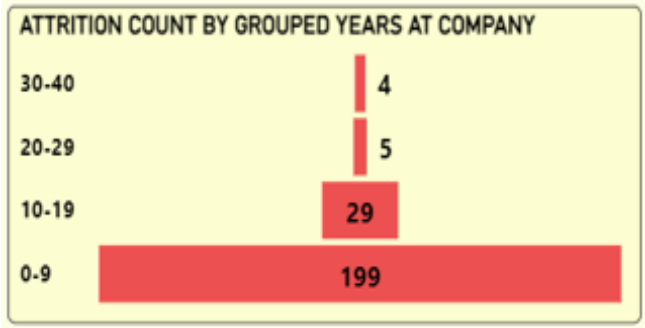
|---|---|
| **Visual** |  |
| **Justification** | (Performance Rating and Attrition Count)<br>• Funnel charts are ideal for comparing counts across different categories.<br>• The funnel chart effectively highlights the volume of attrition in the two performance rating categories, making differences clear immediately. |
| **Description of Data** | • The chart shows attrition counts segmented by performance rating.<br>• The two performance ratings are:<br>➢ 3 with a count of 200.<br>➢ 4 with a count of 37. |
| **Key Findings** | • Most of the attrition occurs among employees with a performance rating of 3 (200 individuals).<br>• Employees with a performance rating of 4 experience significantly lower attrition (only 37 individuals).<br>• This indicates a possible correlation between higher performance ratings and lower attrition, suggesting that better-performing employees are more likely to stay with the company. |

**BUSINESS QUESTION 4:** WHAT INSIGHT CAN BE OBTAINED FROM THE EMPLOYEE PERSONAL INFORMATION, INCLUDING THE EMPLOYEE EDUCATIONAL BACKGROUND AND THE EMPLOYEE PREVIOUS WORK HISTORY, ON THE ATTRITION?




**DESCRIPTION OF THE CHARTS FOR THE INSIGHT ON THE ATTRITION FROM THE EMPLOYEE PERSONAL DETAILS, INCLUDING THE EMPLOYEE EDUCATIONAL BACKGROUND AND THE EMPLOYEE PREVIOUS WORK HISTORY**

| | |
|---|---|
| **Visuals** | **CARD VISUALS WITHOUT ANY SLICER EFFECT** |
| |   |
| | **CARD VISUALS WITH SLICER FOR ATTRITION SET AS 'YES'** |
| |   |
| | **CARD VISUALS WITH SLICER FOR ATTRITION SET AS 'NO'** |
| |   |

| | |
|---|---|
| **Justification** | • Displaying key summary metrics in a text-based format provides a quick overview of the dataset. These metrics contextualize the charts by highlighting average values. |
| **Description of Data** | • The metrics include average age, total working years, years with the current manager, years in the current role and distance from home.<br>• The cards show the values without any slicer, with slicer for attrition condition as yes, and with slicer for attrition condition set as no. |
| **Key Findings** | • Employees who left ("Yes") have a lower average age (34 Years), a lower total working years (9 Years), a lower average years with the current manager (4 Years), a lower average years in current role (4 years) and generally stay further away from the company (10.6 Miles) compared to the averages for the overall employees and to the averages for the active employees. |
| | |
| **Visual** |  |
| **Justification** | (Attrition Count by Grouped Years at Company)<br>• The Funnel charts effectively shows the count of employees based on their years at the company and highlights attrition rates across these categories. |
| **Description of the Data** | • The x-axis represents the years in group at the company (0-9, 10-19, 20-29, 30-40), and the y-axis displays the number of employees. The data indicates how long employees stayed at the company before attrition. |
| **Key findings** | • The highest attrition occurs in the 0-9 years category, with 199 employees affected. |

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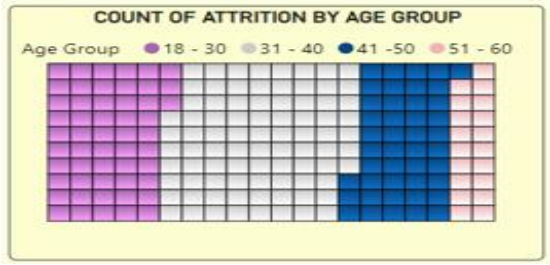
| | • There is a significant drop in attrition as tenure increases, with minimal attrition beyond 10 years at the company.<br>• This suggests a potential challenge in retaining newer employees. |
| | |
| **Visual** |  |
| **Justification** | (Count of Attrition by Age Group)<br>• Brick charts are particularly effective for visually representing the count of data within different categories. The size of each group of bricks corresponds to the count of observations in that category.<br>• The Brick chart effectively shows attrition counts across the age groups. |
| **Description of the Data** | (Count of Attrition by Age Group)<br>• The data is divided into four age groups: 18-30, 31-40, 41-50, and 51-60.<br>• The size of each group of bricks corresponds to the count of attrition cases in that age group, which are differentiated via color code. |
| **Key findings** | • Most of the attrition cases are concentrated in the 18-30 and 31-40 age groups.<br>• Attrition decreases significantly in the 41-50 and 51-60 age ranges.<br>• Younger employees appear to be at a higher risk of leaving. |
| | |

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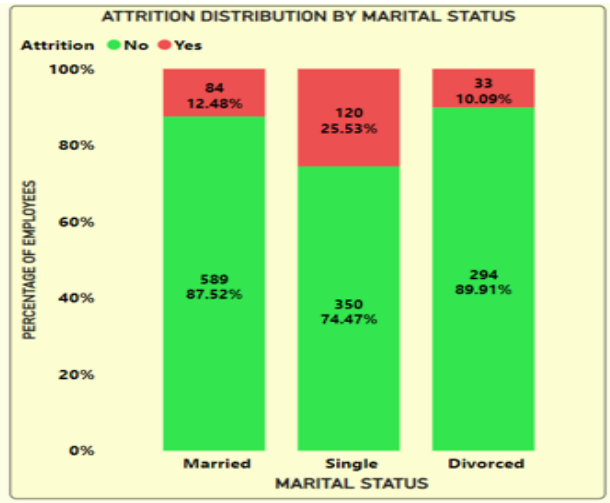
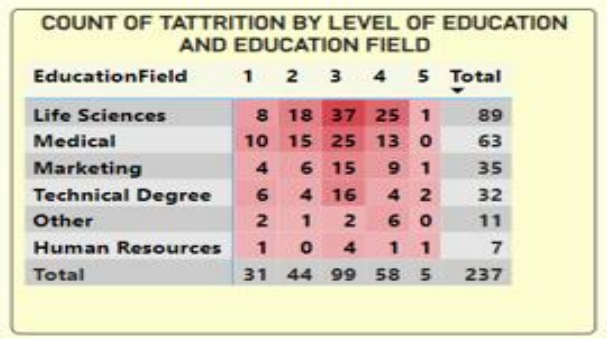
|---|---|
| **Visual** |  |
| **Justification** | (Attrition Distribution by Marital Status)<br>• The 100% stacked column chart helps visualize the attrition rate segmented by marital status. |
| **Description of Data** | • The marital status categories (Married, Single, Divorced) are on the x-axis, while the y-axis shows the percentage of employees. The chart segments display the proportion of employees who stayed or left (No Attrition vs. Yes Attrition). |
| **Key Findings** | • Single employees show the highest attrition rate (25.53%) compared to the divorced employees with attrition rate of (10.09%) and the married employees with a 12.48% attrition rate. |
| | |
| **Visual** |  <br>EducationField 1 2 3 4 5 Total<br>Life Sciences 8 18 37 25 1 89<br>Medical 10 15 25 13 0 63<br>Marketing 4 6 15 9 1 35<br>Technical Degree 6 4 16 4 2 32<br>Other 2 1 2 6 0 11<br>Human Resources 1 0 4 1 1 7<br>Total 31 44 99 58 5 237 |
| **Justification** | (Attrition Count by Level of Education and Education Field)<br>• The matrix chart helps to identify patterns across the education levels and fields related to attrition. |

| | |
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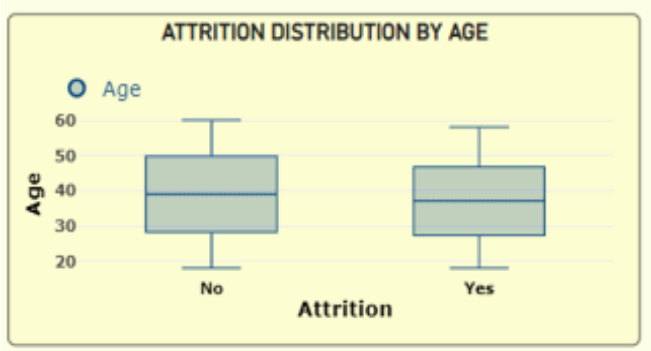
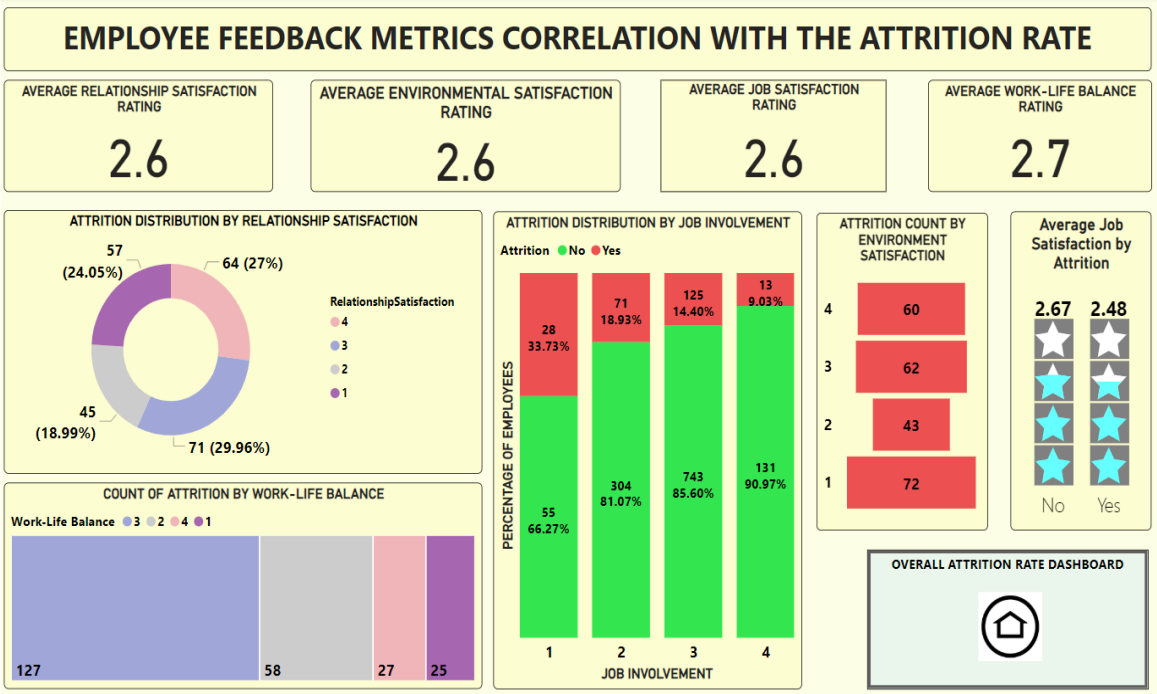
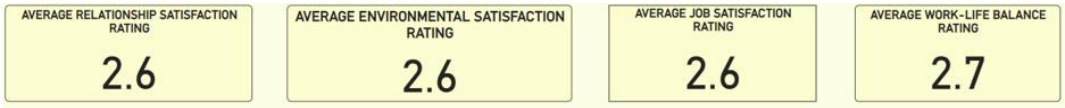
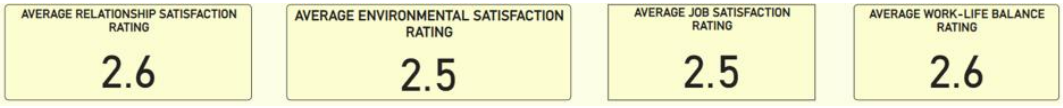
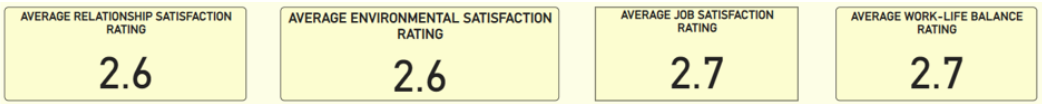
| **Description of Data** | • Education levels (1 to 5) are mapped against various fields of education (Life Sciences, Medical, Marketing, Technical Degree, Human Resources, and Other). The intensity of the colors represents the count of attrition cases. |
| **Key Findings** | • Life Sciences and Medical fields show the highest attrition.<br>• The Human Resources field exhibits significantly lower attrition counts.<br>• The employees with education level 5 have significantly lower attrition counts. |
| | |
| **Visual** |  |
| **Justification** | (Attrition Distribution by Age)<br>• The Box and Whisker plot charts effectively summarize the age distribution for the employees who stayed versus those who left. |
| **Description of Data** | • The x-axis splits the data into "No Attrition" and "Yes Attrition" categories, while the y-axis represents employee age. The chart includes medians and the quartiles, while there is no outlier. |
| **Key Findings** | • The median age for employees with no attrition is higher than those with attrition, suggesting younger employees are more likely to leave.<br>• The interquartile range for "Yes Attrition" is narrower, indicating less variation in the ages of employees who left.<br>• Attrition is concentrated in the younger age brackets. |

**BUSINESS QUESTION 5:** WHAT INSIGHT CAN BE OBTAINED FROM THE EMPLOYEE FEEDBACK INFORMATION WITH REGARDS TO THE ATTRITION?




**DESCRIPTION OF THE CHARTS FOR THE INSIGHT ON THE ATTRITION FROM THE EMPLOYEE FEEDBACK INFORMATION WITH REGARDS TO THE ATTRITION**

| | |
|---|---|
| **Visual** | **CARD VISUALS WITHOUT ANY SLICER EFFECT** |
| |   |
| | **CARD VISUALS WITH SLICER FOR ATTRITION SET AS 'YES'** |
| |   |
| | **CARD VISUALS WITH SLICER FOR ATTRITION SET AS 'NO'** |
| |   |
| **Justification** | • The card visuals are effective for displaying single, key metrics in a clear and |

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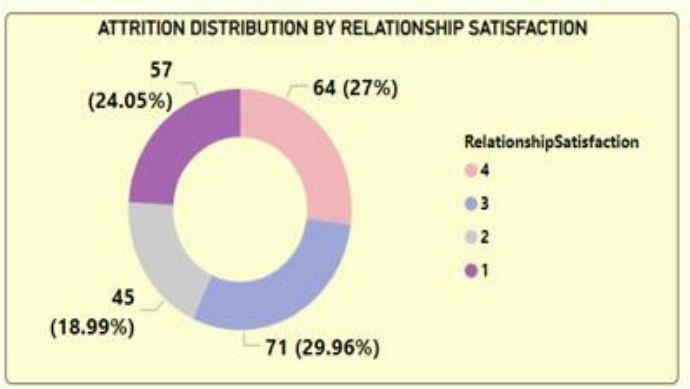
| | concise manner. They are easy to read and understand at a glance. |
| **Description of Data** | • Each card displays the average rating for a specific employee feedback metric (Relationship Satisfaction, Environmental Satisfaction, Job Satisfaction, and Work-Life Balance).<br>• The cards show the values without any slicer, with slicer for attrition condition as yes, and with slicer for attrition condition set as no. |
| **Key Findings** | • Employees who left ("Yes") have a slightly lower average environment satisfaction rating (2.5), a slightly lower average job satisfaction rating (2.5), a slightly lower average work-life balance rating (2.6) compared to the averages for the overall employees and to the averages for the active employees. These indicate the environment satisfaction, job satisfaction and work-life balance might have slight effect on the attrition rate.<br>• All the groups have similar relationship satisfaction ratings (2.6), indicating the relationship satisfaction metric might not be a strong driver of attrition. |
| | |
| **Visual** |  |
| **Justification** | (Attrition Distribution by Relationship Satisfaction)<br>• Donut charts are well-suited for visualizing the distribution of categorical data. They provide a visually appealing and easily interpretable representation of the proportions within a whole. |
| **Description of the Data** | • The donut chart displays the distribution of attrition cases across different levels of Relationship Satisfaction ratings (1-4). |

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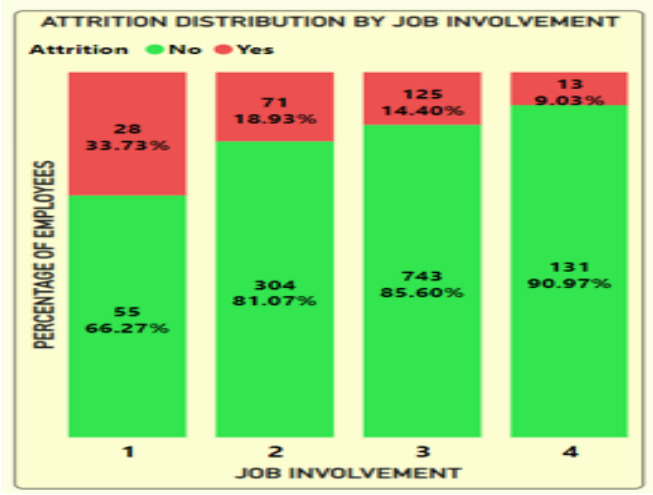
| | • Each segment of the donut represents the proportion of employees who have left the company (attrition) within a specific level of Relationship Satisfaction.<br>• The size of each segment is proportional to the percentage of employees who have left within that relationship satisfaction level. |
| **Key findings** | • The highest attrition count is observed among employees with a relationship satisfaction rating of 3 while the lowest attrition count is observed among employees with a relationship satisfaction rating of 2. |
| | |
| **Visual** |  |
| **Justification** | (Attrition Distribution by Job Involvement)<br>• The 100% stacked column chart helps to effectively show the proportion of employees who have left and stayed within each job involvement level. |
| **Description of the Data** | • The chart displays the number of employees who have left and stayed, stacked within each job involvement level (1-4). The percentages within each bar represent the proportion of attrition within that job involvement level. |
| **Key findings** | • Employees with lower job involvement (level 1) have significantly higher attrition rates compared to those with higher job involvement (level 4).<br>• The attrition rate decreases with a higher level of job involvement. |
| | |

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|---|---|
| **Visual** |  |
| **Justification** | (Attrition Distribution by Environment Satisfaction)<br>• The infographic designer chart effectively uses a visual comparison to highlight the difference in average job satisfaction between employees who left the company and those employees who are still working with the company.<br>• The use of stars to represent the average job satisfaction score makes the information easy to understand and interpret at a glance, more engaging and memorable than simply displaying numerical values. |
| **Description of Data** | • The chart compares the Average Job Satisfaction between two groups: employees who are still working with the company and the employees who have left the company.<br>• Each group is represented by a column of stars. Each full star represents a full point on the job satisfaction scale (1-4).<br>• The employees who have not left have the average job satisfaction is 2.67 while the employees who have left, the average job satisfaction is 2.48. |
| **Key Findings** | • Employees who have left the company have a lower average job satisfaction score (2.48) compared to those who remain with the company (2.67). This finding suggests a potential correlation between low job satisfaction and employee attrition. Employees with lower job satisfaction may be more likely to leave the company. |

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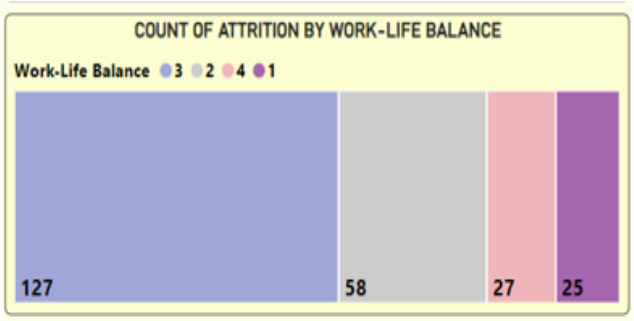
| **Visual for the key findings** |  |
| **Justification** | (Attrition Count by Work-Life Balance)<br>• Treemap charts are ideal for displaying categorical data in a space-efficient way. The different categories of work-life balance ratings are represented proportionally to their values.<br>• The chart clearly shows the relative size (count of attrition) for each work-life balance category using both size (area) and color. |
| **Description of Data** | • The Work-Life Balance rating scale was categorized as 1, 2, 3, and 4.<br>• The attrition count across the work-life balance ratings category are as follows:<br>➢ Rating 3 (largest blue area) represents 127 cases of attrition.<br>➢ Rating 2 (gray area) represents 58 cases.<br>➢ Rating 4 (pink area) represents 27 cases.<br>➢ Rating 1 (purple area) represents 25 cases. |
| **Key Findings** | • Work-Life Balance ratings 1 and 4 have the smallest attrition counts (25 and 27, respectively).<br>• Employees with a Work-Life Balance rating of 2 have intermediate attrition count, totaling 58 cases.<br>• A significant proportion of attrition is concentrated in employees with a Work-Life Balance rating of 3. Understanding the reasons behind this might help organizations target interventions to reduce attrition in this group. |

| | |
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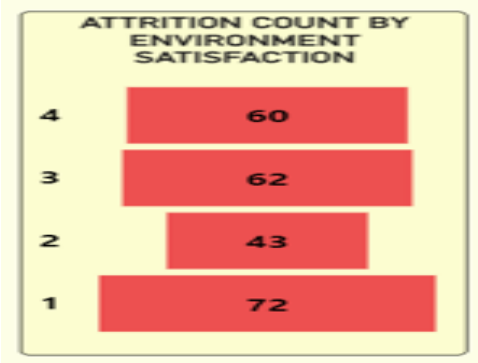
| **Visual for the key findings** |  |
| **Justification** | (Attrition Count by Environment Satisfaction)<br>• The funnel chart effectively highlights the volume of attrition in the 4 environment satisfaction rating categories, making differences clear immediately. |
| **Description of Data** | • The funnel chart displays the number of employees at each level of environment satisfaction (1-4).<br>• The width of each stage in the funnel represents the number of employees who left the company at that particular level of environment satisfaction. |
| **Key Findings** | • The employees with environmental satisfaction rating of 4 have the highest attrition count while employees with environmental rating of 2 has the lowest attrition count |

## CONCLUSION AND RECOMMENDATIONS

### CONCLUSION

The analysis reveals that employee attrition within the organization is influenced by several key factors. Younger employees, particularly those aged 21 or less, exhibit the highest attrition rates. Early-career employees, employees in lower job levels (especially Job Level 1), and those working overtime are at a significantly higher risk of leaving. Financial dissatisfaction, including lower average monthly incomes and limited stock options, is another prominent driver of attrition. Additionally, job roles like Sales Representative and departments such as Sales and Research & Development have higher attrition rates. While work-life balance, job satisfaction, and environmental satisfaction play a role, factors like relationship satisfaction and training time are less influential. Overall, the findings underscore the importance of addressing key pain points—compensation, career development, and workload—to improve employee retention.

### RECOMMENDATIONS

1. **Enhance Compensation and Benefits:**
    - Review and adjust salary structures, particularly for employees in entry-level positions and at-risk job roles.
    - Introduce or improve stock option offerings to incentivize long-term commitment.
2. **Focus on Career Development:**
    - Establish clear growth pathways for employees, especially those in Job Level 1.
    - Increase mentorship and training opportunities to support early-career employees.
3. **Address Workload and Work-Life Balance:**
    - Monitor and regulate overtime to prevent burnout.
    - Offer flexible working hours or remote work options to employees with high workloads.
4. **Targeted Retention Strategies for At-Risk Groups:**
    - Develop tailored retention plans for younger employees, single employees, and

employees in departments with high attrition rates.

- Conduct exit interviews to understand specific concerns within these groups.

5. **Improve Job Satisfaction and Workplace Environment:**
   - Regularly assess employee satisfaction through surveys and focus groups.
   - Implement programs to enhance job satisfaction and environmental satisfaction, such as recognition programs and workplace improvements.
6. **Department-Specific Interventions:**
   - Address specific attrition challenges in high-risk departments like Sales and Research & Development through targeted programs.
   - Provide additional support to employees in roles with historically high attrition rates, such as Sales Representatives.

**PERSONAL CONCLUSION AND RECOMMENDATIONS**

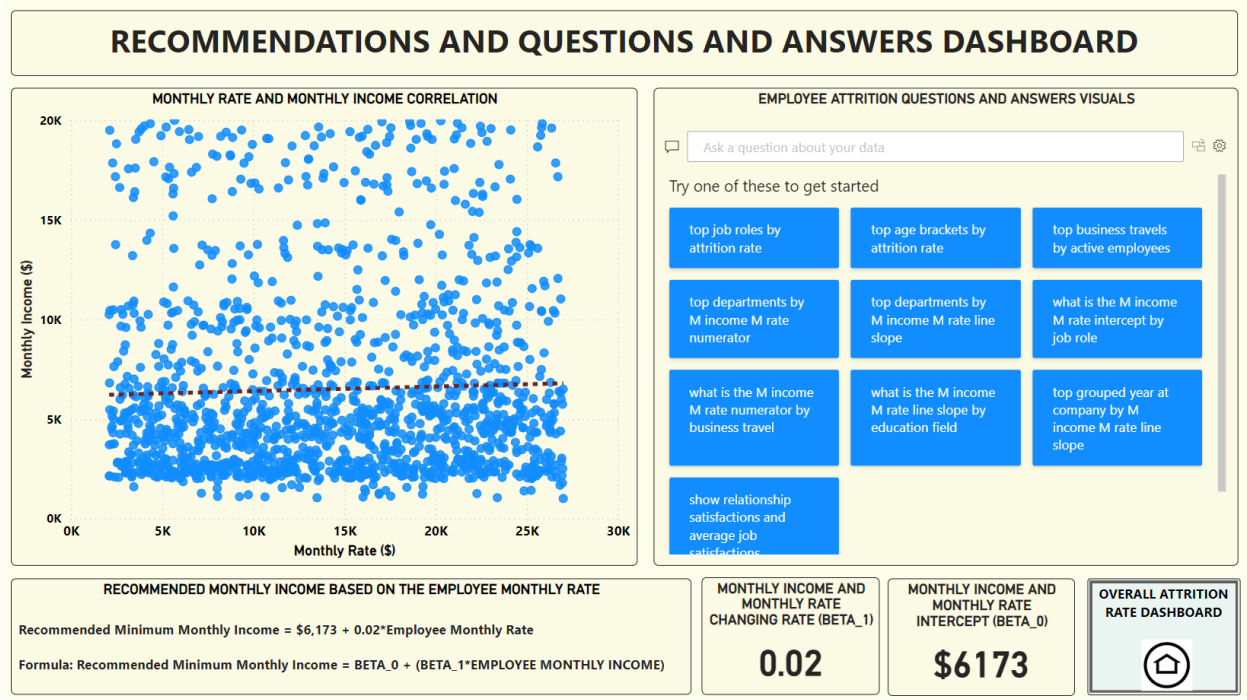
The Question-and-Answer Visual section on the dashboard (*see the dashboard below*) can be used to explore additional insights into the data analysis.

As shown in the dashboard below, the recommended minimum monthly income based on the existing employees' monthly rate is calculated as:

Monthly Income = $6,173 + 0.02 × Employee Monthly Rate

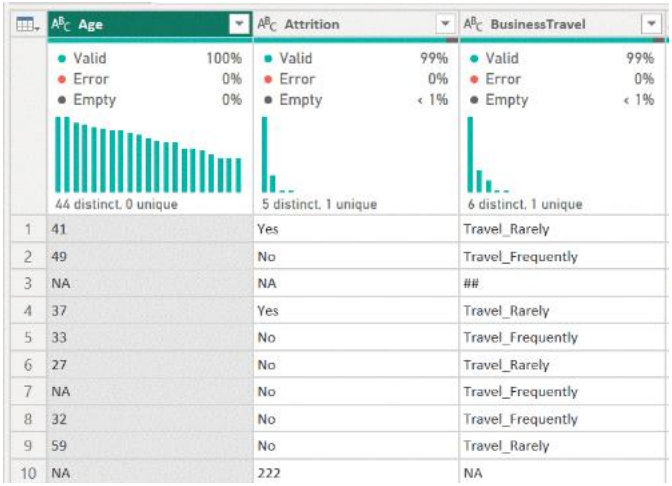
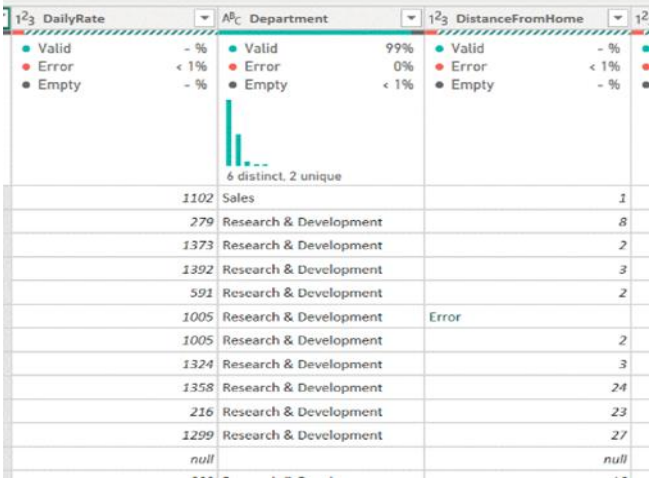
Although the slope of the regression line (0.02) indicates a weak correlation between monthly rate and monthly income—evidenced by the broad spread of monthly income values at each monthly rate—implementing the adjusted minimum monthly income will help address financial dissatisfaction. This recommendation aims to reduce the statistical gap between the monthly incomes of employees who left and those who remain active.

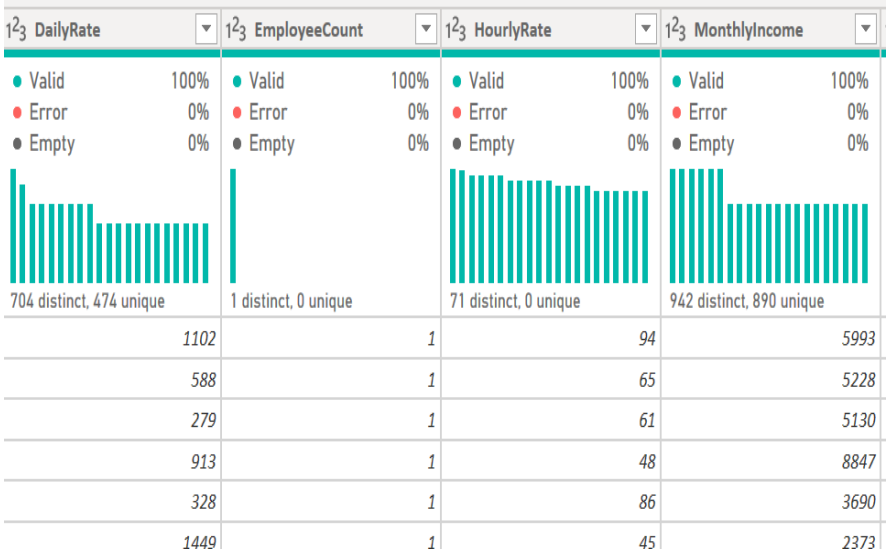
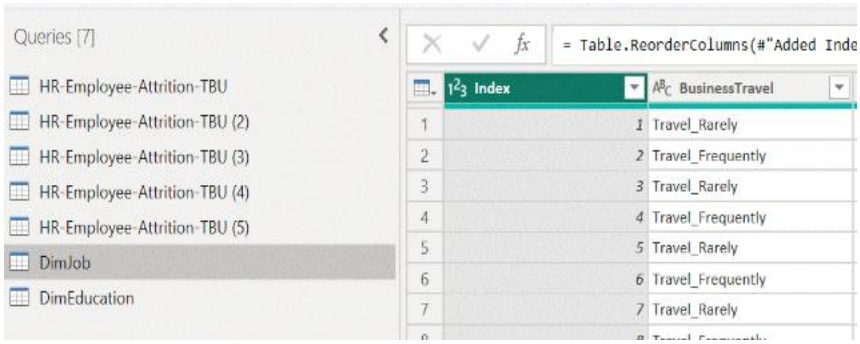
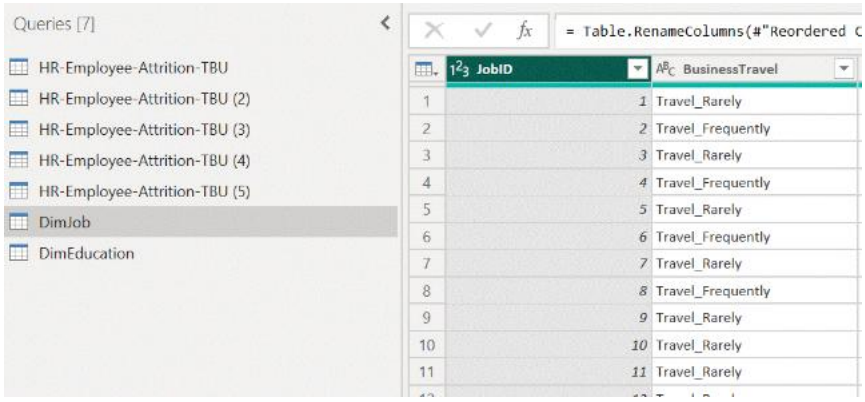
By implementing this adjustment, the organization can create a more equitable and supportive work environment, leading to increased employee satisfaction, improved retention, and a reduction in attrition rates.

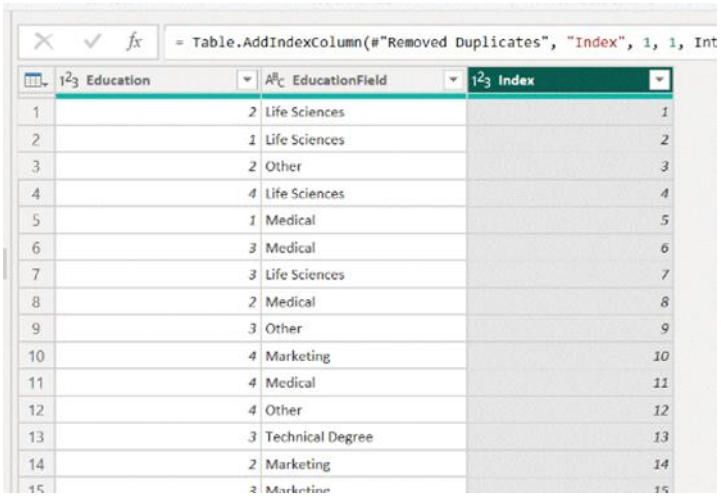
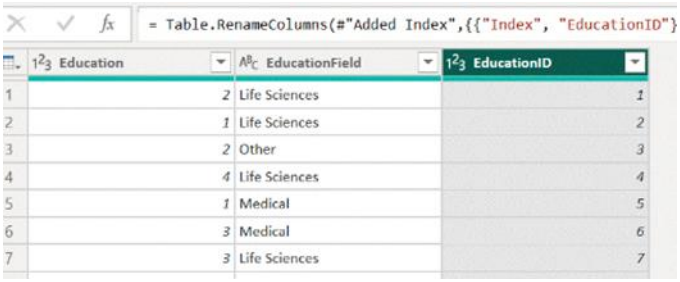
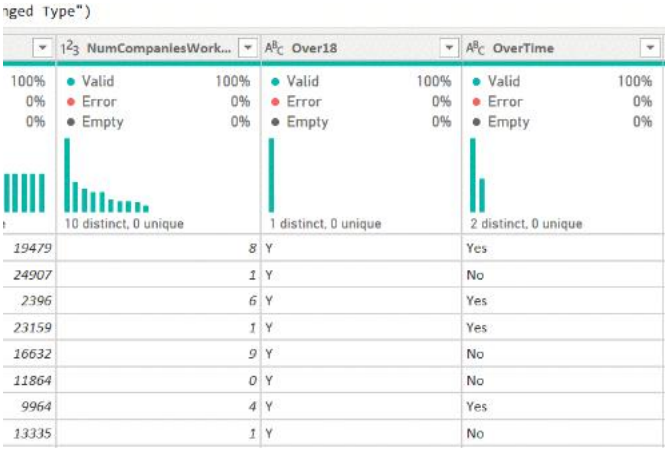

RECOMMENDATIONS AND QUESTIONS AND ANSWERS DASHBOARD
MONTHLY RATE AND MONTHLY INCOME CORRELATION
Monthly Income ($)
20K
15K
10K
5K
0K
0K
5K
10K
15K
20K
25K
30K
Monthly Rate ($)
EMPLOYEE ATTRITION QUESTIONS AND ANSWERS VISUALS
Ask a question about your data
Try one of these to get started
top job roles by attrition rate
top age brackets by attrition rate
top business travels by active employees
top departments by M income M rate numerator
top departments by M income M rate line slope
what is the M income M rate intercept by job role
what is the M income M rate numerator by business travel
what is the M income M rate line slope by education field
top grouped year at company by M income M rate line slope
show relationship satisfactions and average job
RECOMMENDED MONTHLY INCOME BASED ON THE EMPLOYEE MONTHLY RATE
Recommended Minimum Monthly Income = $6,173 + 0.02*Employee Monthly Rate
Formula: Recommended Minimum Monthly Income = BETA_0 + (BETA_1*EMPLOYEE MONTHLY INCOME)
MONTHLY INCOME AND MONTHLY RATE CHANGING RATE (BETA_1)
0.02
MONTHLY INCOME AND MONTHLY RATE INTERCEPT (BETA_0)
$6173
OVERALL ATTRITION RATE DASHBOARD

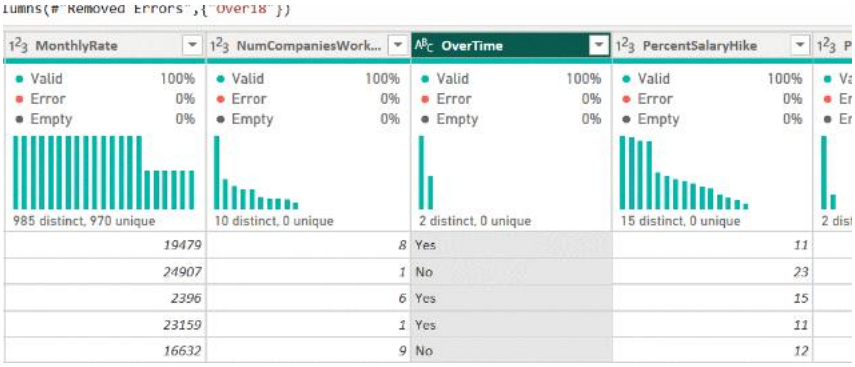
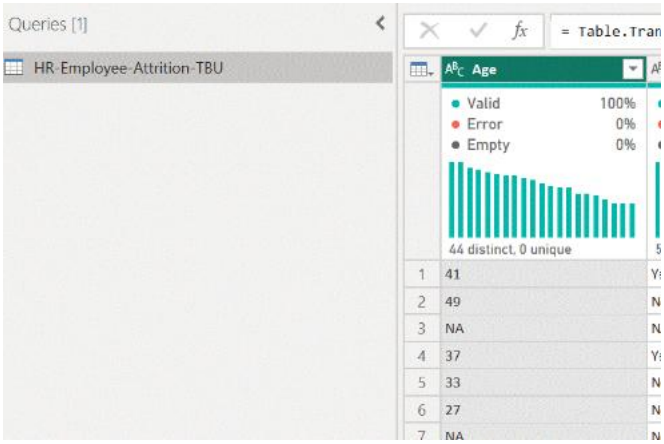
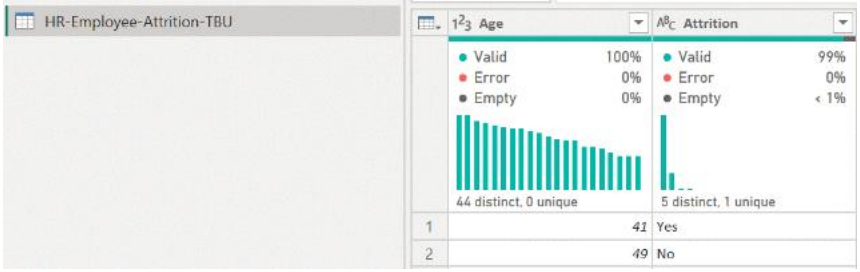
## APPENDIX

## APPENDIX - A

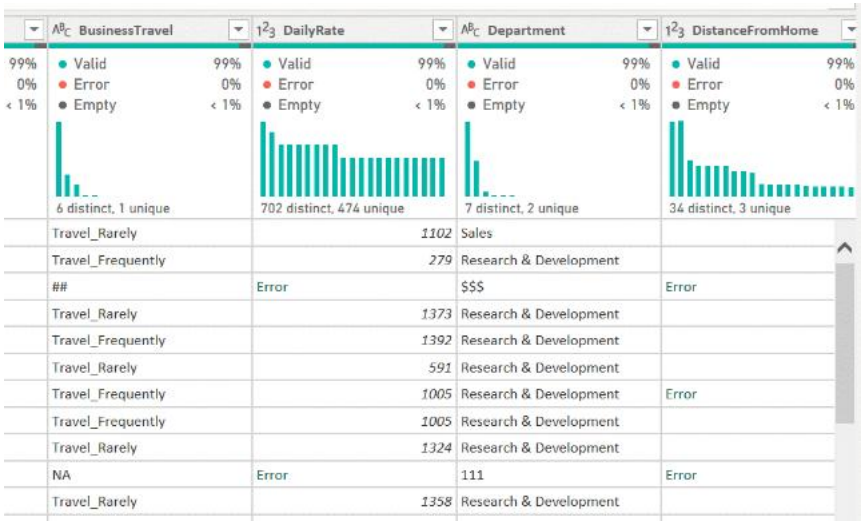
| A) DATA PRE-PROCESSING AND DATA CLEANSING | |
|---|---|
| Kindly note that NAs, blanks, errors, et cetera were forced into the dataset for the purpose of carrying out some of the pre-processing steps below. | |
| **Requirements** | **Evidence of the data pre- processing steps.**<br>**Include screenshots of your Power BI project in your presentation to illustrate the effect of each pre-processing step.** |
| • Removing NAs, |  |
| |  |

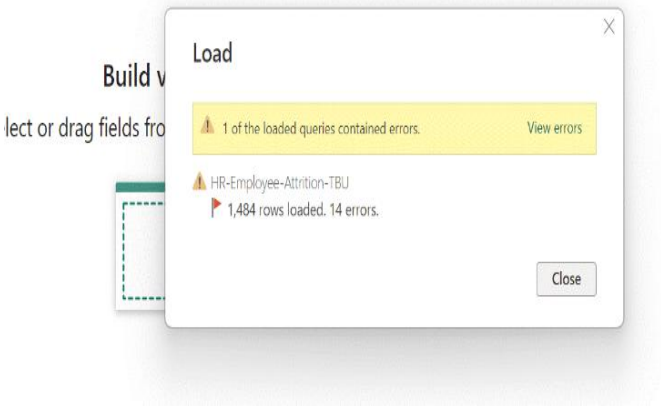
| | |
|---|---|
| |  |
| | The NAs deleted from the dataset. The pictures were attached to show samples of the NAs that were removed. |
| • Renaming columns |  |
| |  |

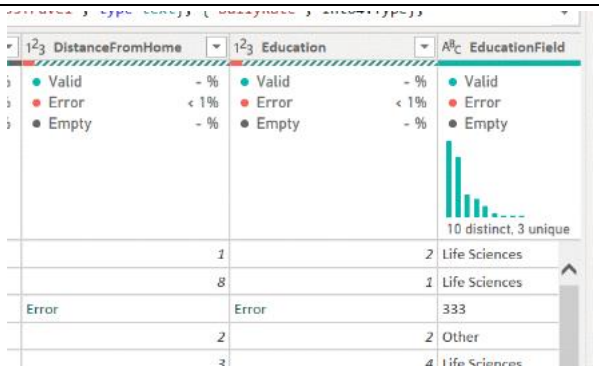
<table>
<tr><td></td><td> 
</td></tr>
<tr><td></td><td> 
</td></tr>
<tr><td></td><td>The index columns renamed as JobID and EducationID. The pictures were attached to show samples of the columns renamed</td></tr>
<tr><td>• Removing columns</td><td> 
</td></tr>
</table>

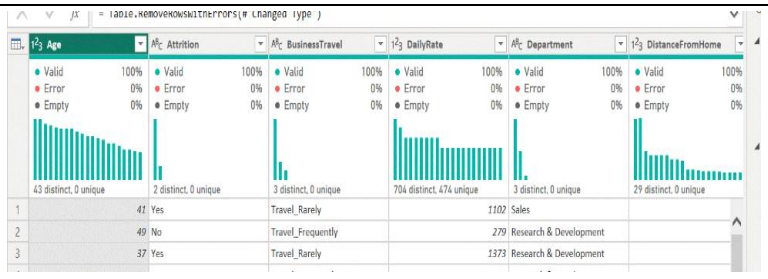
| | |
|---|---|
| |  |
| | The Over18 column was removed. All the employees were Over 18. Hence, the column is not contributing to the analysis. |
| • Changing data types |  |
| |  |
| | The age column data type was changed from text data type to whole number. The pictures are attached to show samples of the columns data type that were changed. |

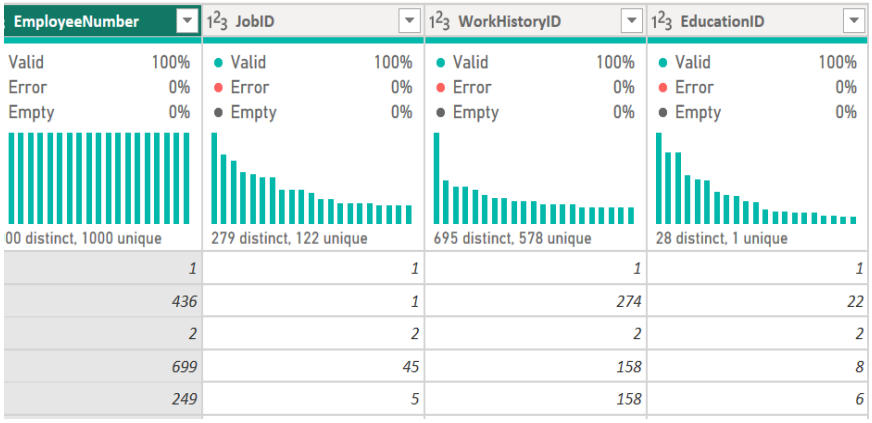
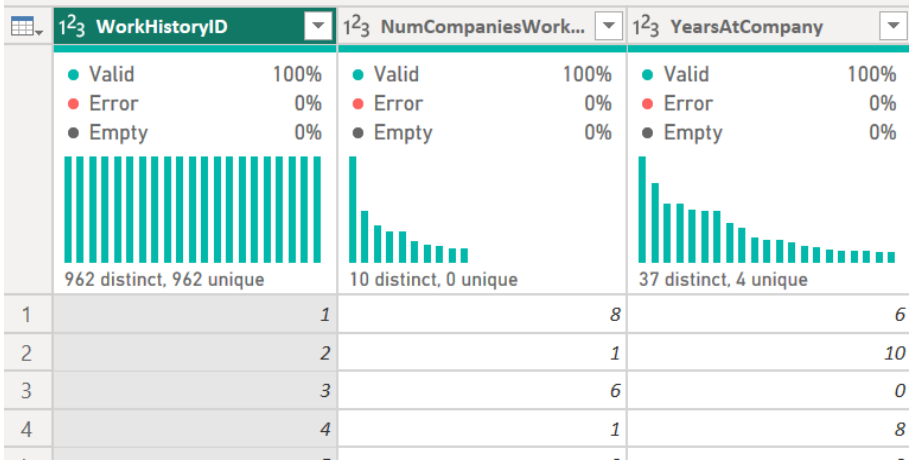
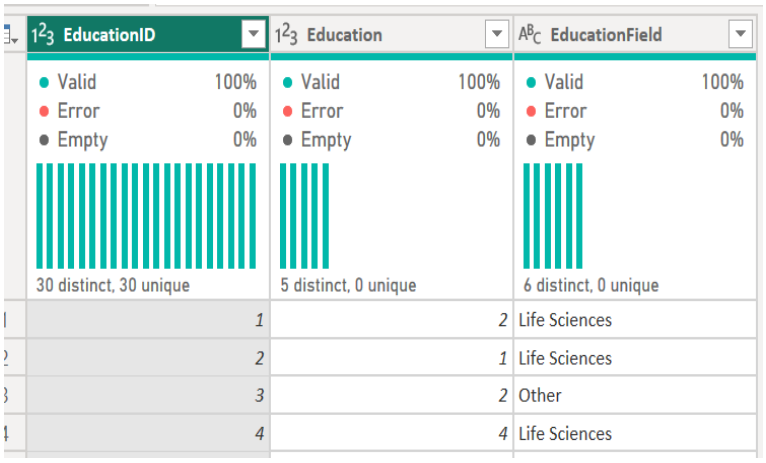
- Removing errors



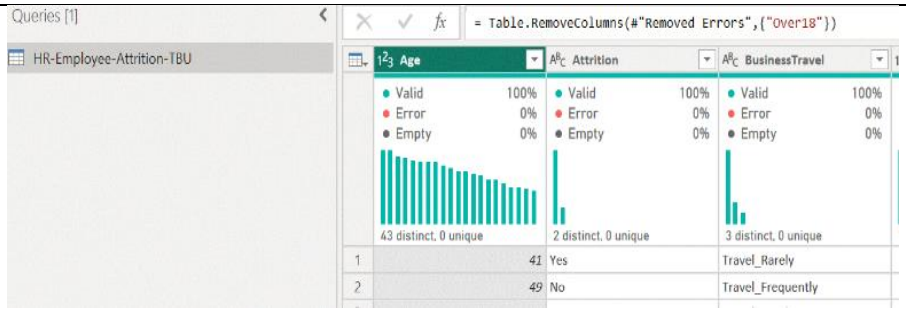
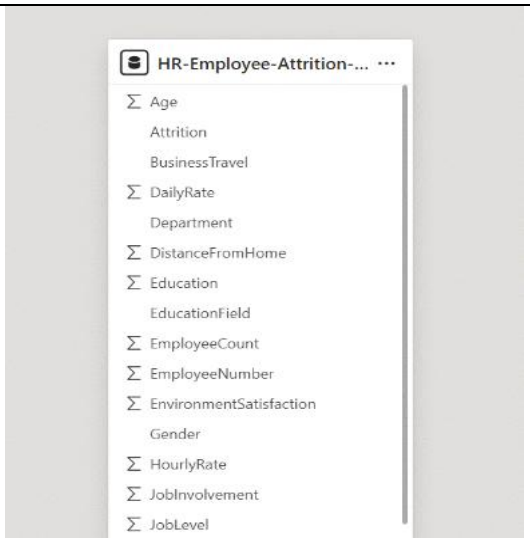



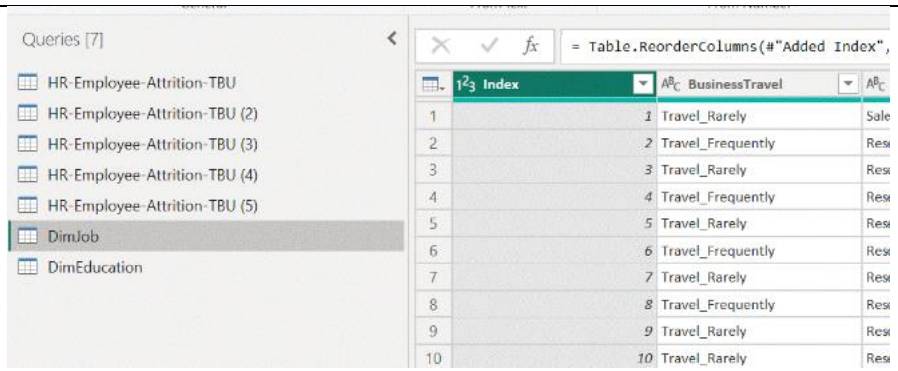



| | |
|---|---|
| | The last picture attached shows the errors have been removed. These pictures are attached as sample for the errors removed during the pre-processing stage. |
| Merging tables etc. |  |
| |  |
| |  |

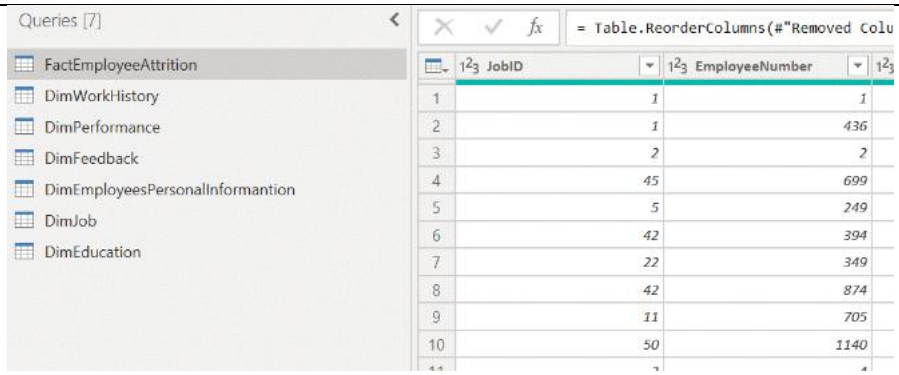
| | |
|---|---|
| | The tables were merged to connect the dimension tables primary keys to the fact table as shown above. The attached pictures are samples from the merged tables carried out during the pre-processing stage. |

**APPENDIX - B**

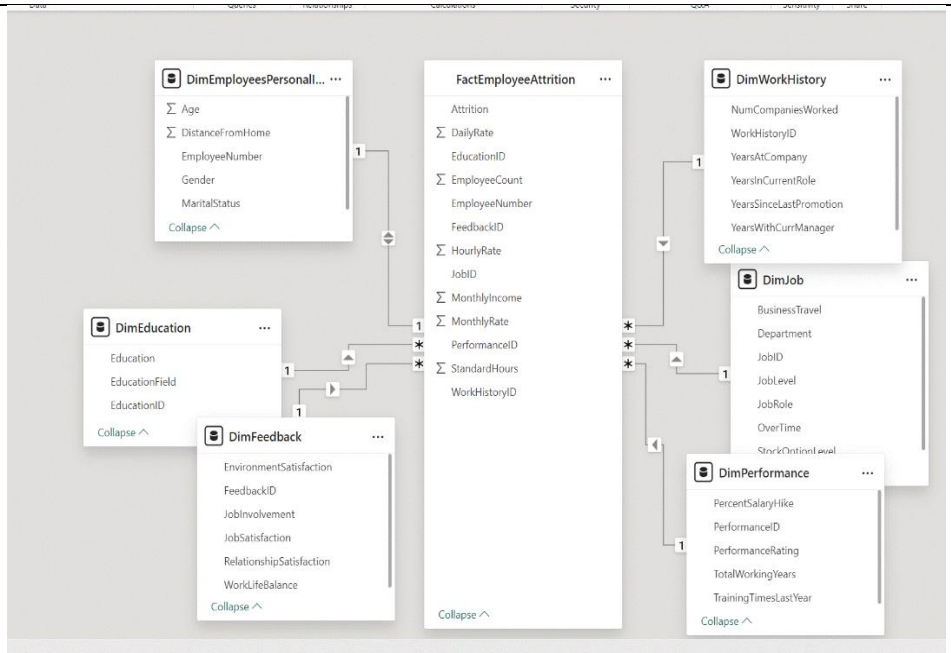
| **B) DATA MODELLING – STAR SCHEMA FACTS AND DIMENSIONS** | |
|---|---|
| Requirements | A description of the data modelling process.<br>You should include screenshots of the data model from your Power BI project to illustrate the effect of the data modelling process.<br><br>If your database is already well-structured and it does not need any modification, show the steps required in this section by deleting at least one relationship and show that you can perform the steps for adding relationships in Power BI. This will meet the first target in this section (creating new relationships). |
| |  |
| | The flat table, after completing the data pre-processing is attached above |
| |  |
| | The single model of the flat table prior to creating the star schema is attached above. |

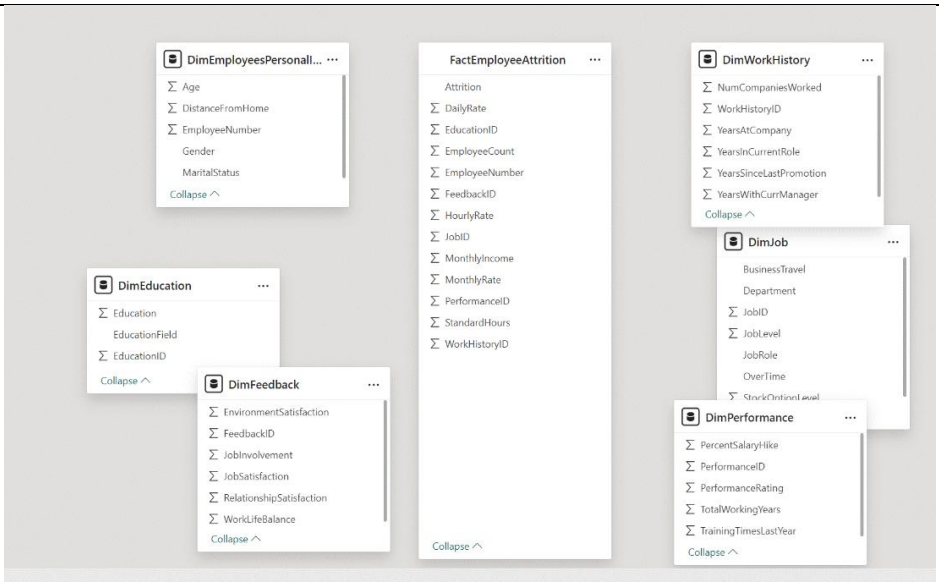
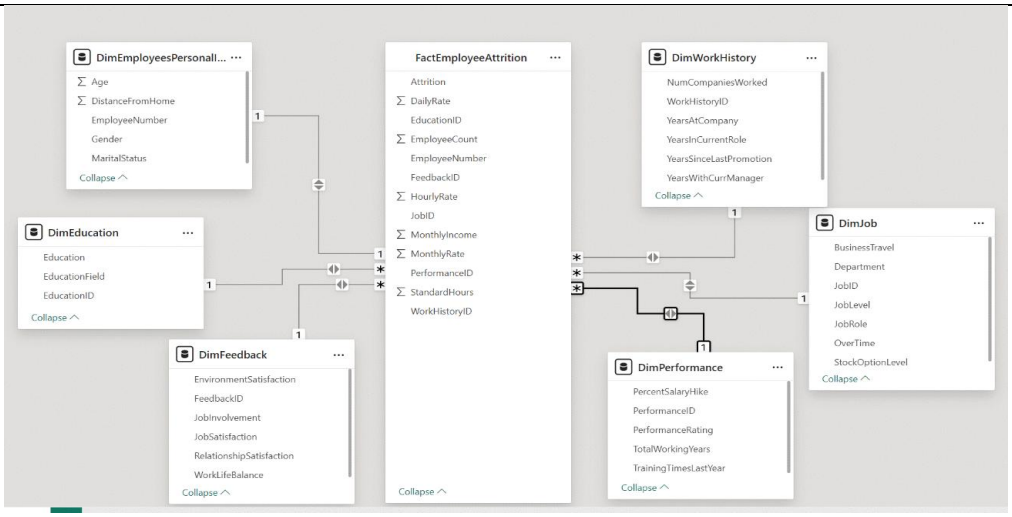



The flat table is duplicated for creating dimension tables. The choose column button is used to select the required columns for each dimension table.

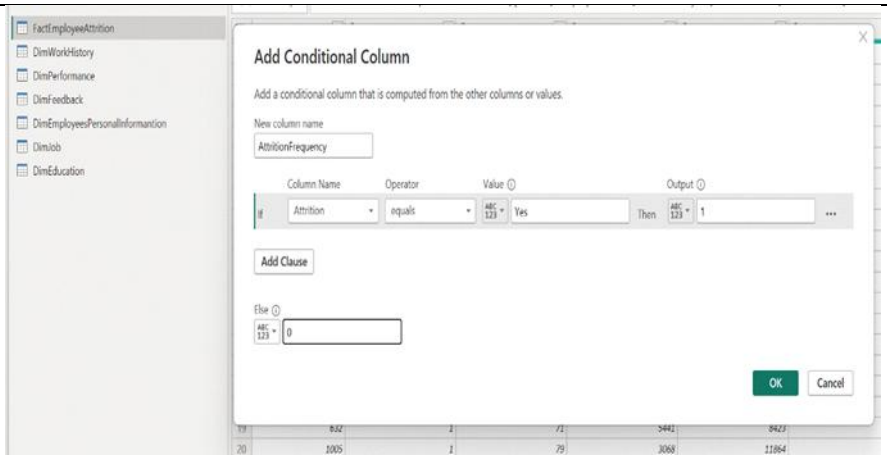
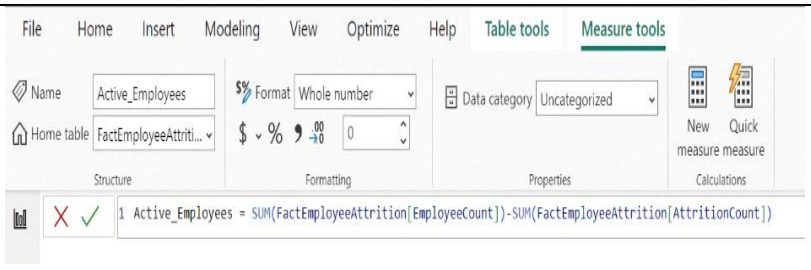


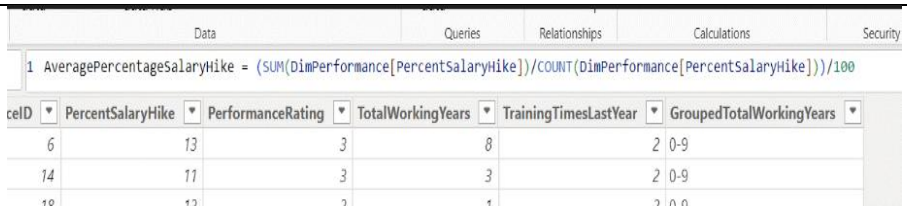
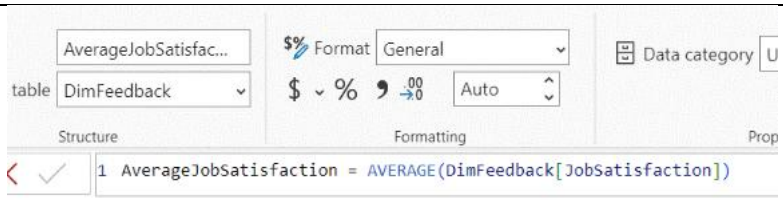

The dimension tables have been completed. The pictures above shows the fact and the dimensions tables

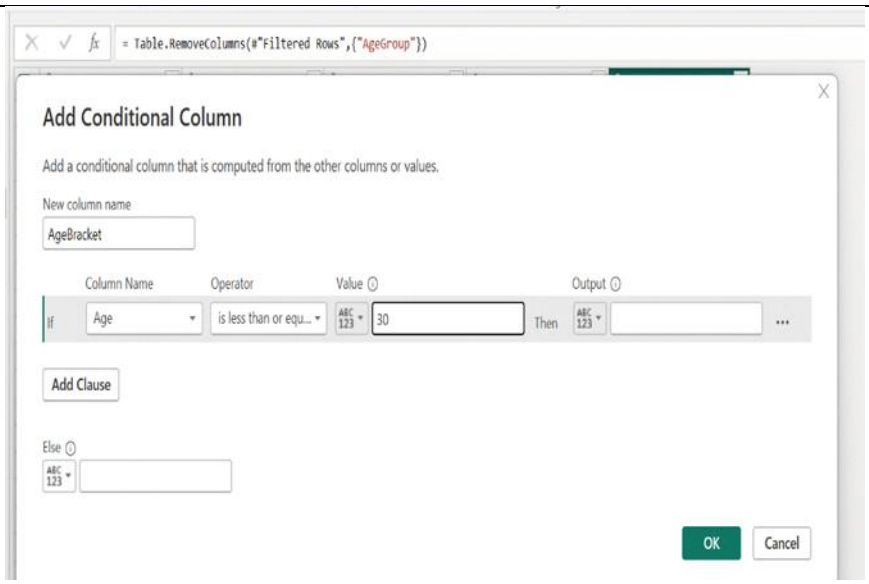


| | |
|---|---|
| | The dimension tables auto-detected by the fact table |
| |  |
| | The relationship between the tables disconnected so that they can be manually connected for the purpose of the ICA |
| |  |
| | The dimension tables have been manually connected to the fact table.<br>5 out of the 6 dimension tables have one-to-many relationship with the fact table. 1 out of the 6 dimension tables have 1-to-1 relationship with the fact table. All the cross-filter direction were set to both. The fact table is connected to dimension tables through the use of foreign keys such as the EducationID, FeedbackID, Work History ID, et cetera. |

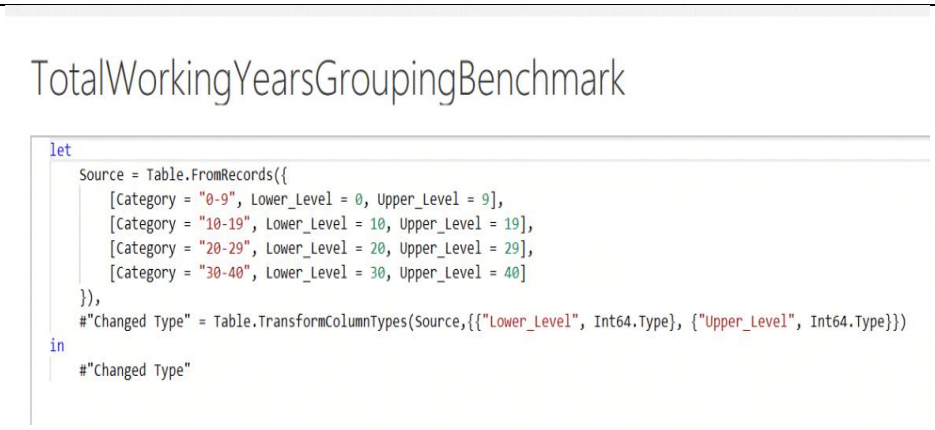
**APPENDIX - C**

| **C) DAX and M Language** | |
|---|---|
| Requirements | Different formulae have been used in the analysis (either DAX or M language)<br>There is a clear understanding of how the formulae have been used. This is shown by providing a clear written explanation of how the applied formula works.<br>New calculated columns have been added to the model<br>New measures have been added to the model |
| |  |
| | Conditional column created. The conditional column was named 'attrition frequency'. It was later renamed to 'attrition count'. The column was created so that the Yes in the attrition column can be turned to 1. The sum of the column was plotted on the card visual to determine the total number of employees who left. |
| |  |

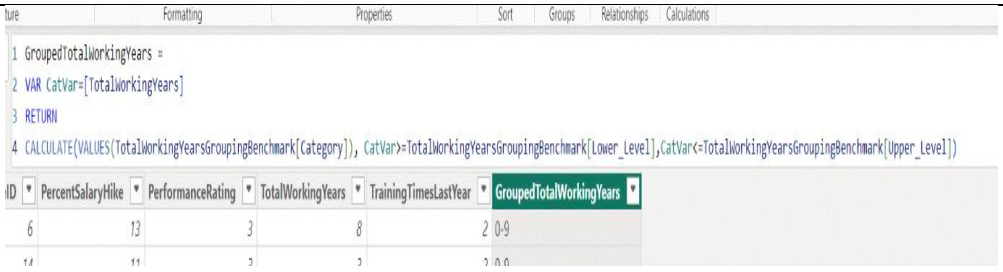
| | |
|---|---|
| | The total number of the employee who left (sum of attrition count) was substracted from the total number of the employees (sum of employee count). This gives the value of the active employees. |
| |  |
| | The sum of the employees who left (sum of attrition count) was divided the total number of the employees(sum of the employee count). The value is changed to percentage, and displayed with a gauge chart to show the attrition rate. |
| |  |
| | The sum of all the percent salary hike of all the employees was divided by the number of values in the percent salary hike column. This calculation gives the average percentage salary hike for the employees. |
| |  |
| | The aveage of the job satisfaction ratings was calculated. |

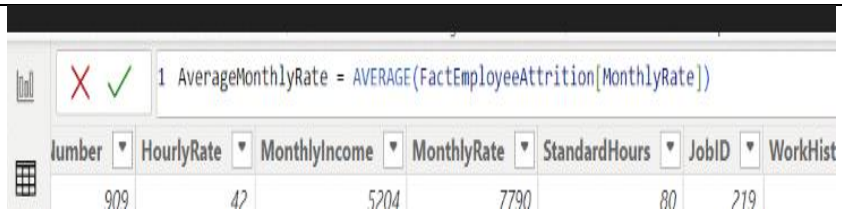
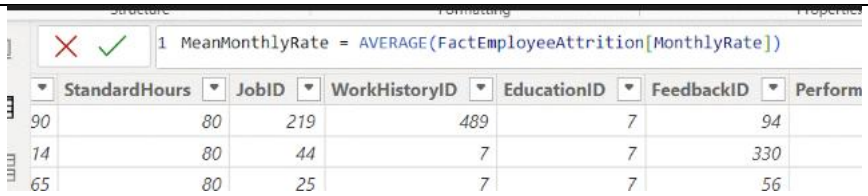
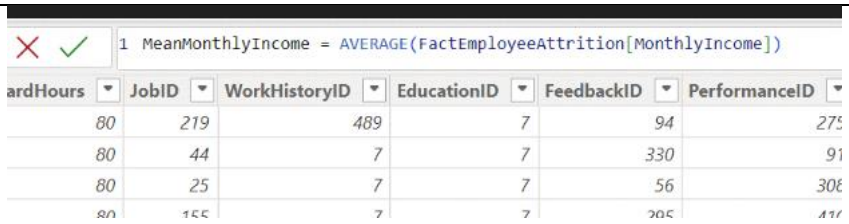
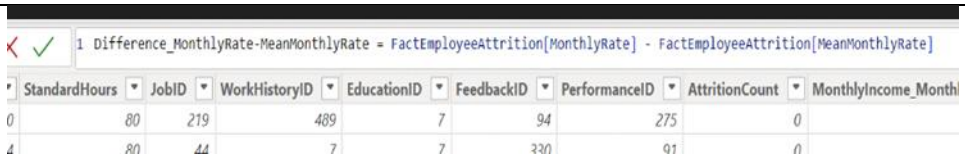


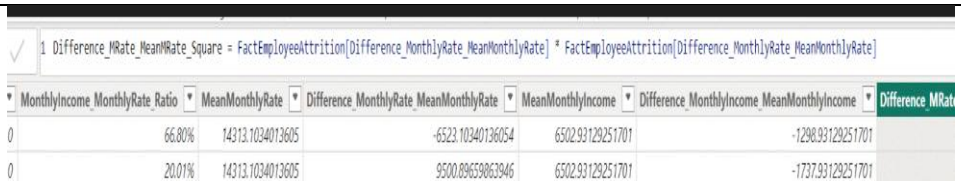
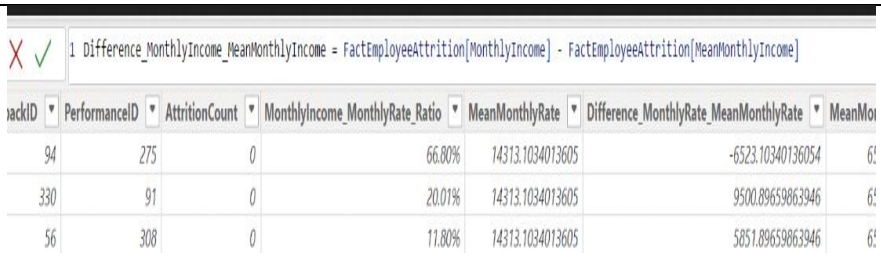
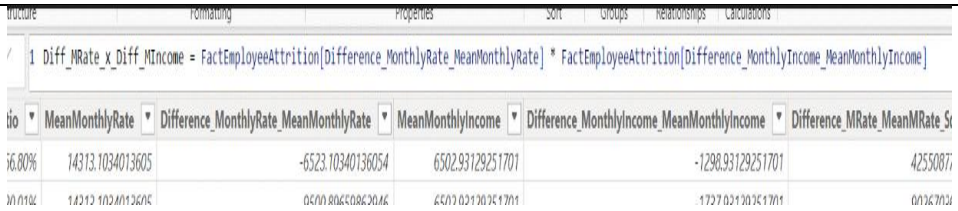
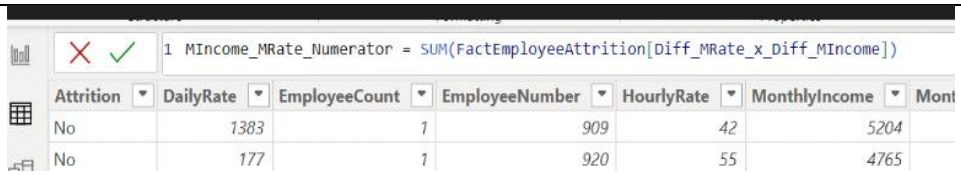

The ‘AgeBracket’ column by catogprizing the values in the age column into different categories that are typed in the output section.

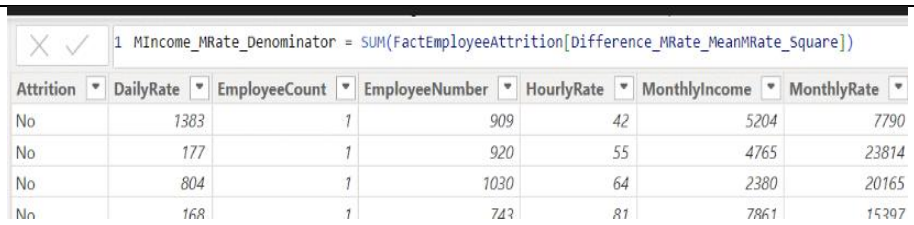



The M-Language on the attached picture above was used to create a new table, which was used as bench mark for grouping the total working years column



| | |
|---|---|
| | The variable CatVar was used to return the range of years in the 'Total Working Years Grouping Benchmark'. The returned range of years is output in the new column declared as 'Grouped Total Working Years'. The range of years that will output depends on the years in the total working years column. |
| |  |
| | The monthly income is divided by the monthly rate and the resulting value is stored in the new column named MonthlyIncome_MonthlyRate_Ratio |
| |  |
| | The mean value of the monthly rate column is calculated as a calculated measure |
| |  |
| | The mean value of the monthly rate is calculated as a calculated column |
| |  |
| | The mean value of the monthly income is calculated as a calculated column |
| |  |

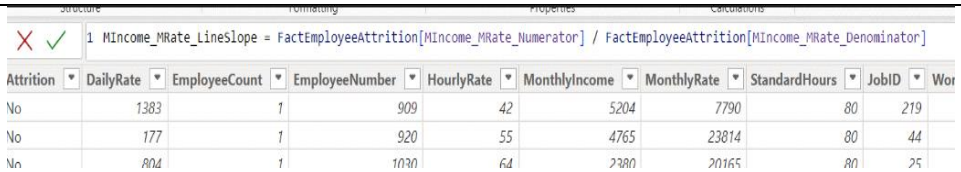
| | |
|---|---|
| | The mean monthly rate is subtracted from each of the monthly rate value and the values are stored in a new column named Difference_MonthlyRate-MeanMonthlyRate |
| |  |
| | The value in the Difference_MonthlyRate-MeanMonthlyRate column was squared and the output was stored in the new column named Difference_Mrate_MeanMRate_Square |
| |  |
| | The mean monthly income is subtracted from each of the values in the monthly income column. The output is stored in the new Difference_MonthlyIncome_MeanMonthlyIncome Column |
| |  |
| | The ‘difference_monthlyrate_meanMonthlyrate’ column is multiplied by the ‘difference_monthlyincome_meanmonthlyincome’ column.<br>The value is stored in the new column named ‘Diff_Mrate_x_Diff_MIncome |
| |  |
| | The values in the Diff_MRate_x_Diff_MIncome column is summed and stored as a calculated measure in ‘MIncome_Mrate_Numerator’ |



```
1 MIncome_MRate_Denominator = SUM(FactEmployeeAttrition[Difference_MRate_MeanMRate_Square])
```

| Attrition | DailyRate | EmployeeCount | EmployeeNumber | HourlyRate | MonthlyIncome | MonthlyRate |
|---|---|---|---|---|---|---|
| No | 1383 | 1 | 909 | 42 | 5204 | 7790 |
| No | 177 | 1 | 920 | 55 | 4765 | 23814 |
| No | 804 | 1 | 1030 | 64 | 2380 | 20165 |
| No | 168 | 1 | 743 | 81 | 7861 | 15397 |

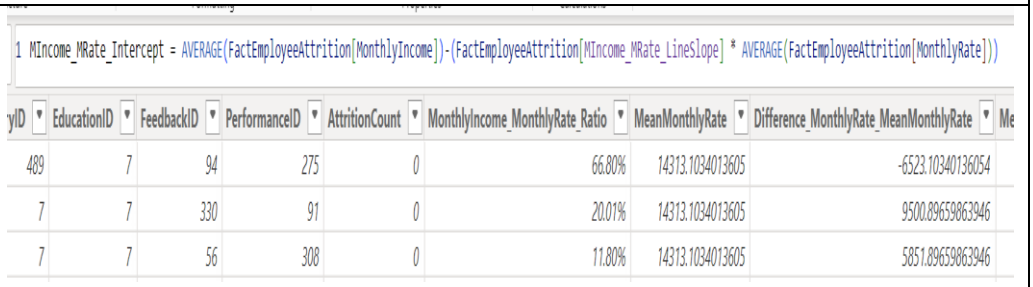
The values in the Difference_MRate_MeanMRate_Square column is summed and stored as a calculated measure in 'MIncome_Mrate_Denominator'



```
1 MIncome_MRate_LineSlope = FactEmployeeAttrition[MIncome_MRate_Numerator] / FactEmployeeAttrition[MIncome_MRate_Denominator]
```

| Attrition | DailyRate | EmployeeCount | EmployeeNumber | HourlyRate | MonthlyIncome | MonthlyRate | StandardHours | JobID | Wor |
|---|---|---|---|---|---|---|---|---|---|
| No | 1383 | 1 | 909 | 42 | 5204 | 7790 | 80 | 219 | |
| No | 177 | 1 | 920 | 55 | 4765 | 23814 | 80 | 44 | |
| No | 804 | 1 | 1030 | 64 | 2380 | 20165 | 80 | 25 | |

The 'MIncome_Mrate_Numerator' is divided by the 'MIncome_Mrate_Denominator' and the value is stored in MIncome_Mrate_Lineslope variable as a calculated measure. This value is the slope of the linear regression line between the employee monthly income and the employee monthly rate.

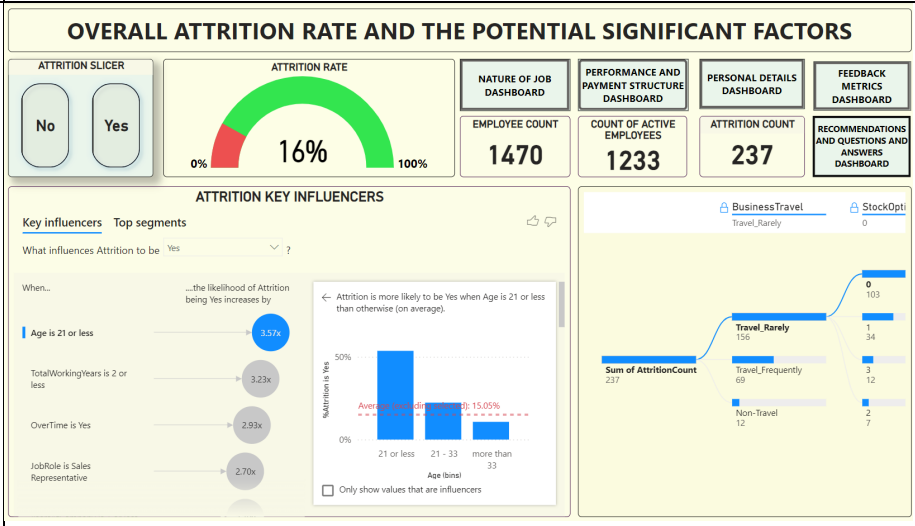


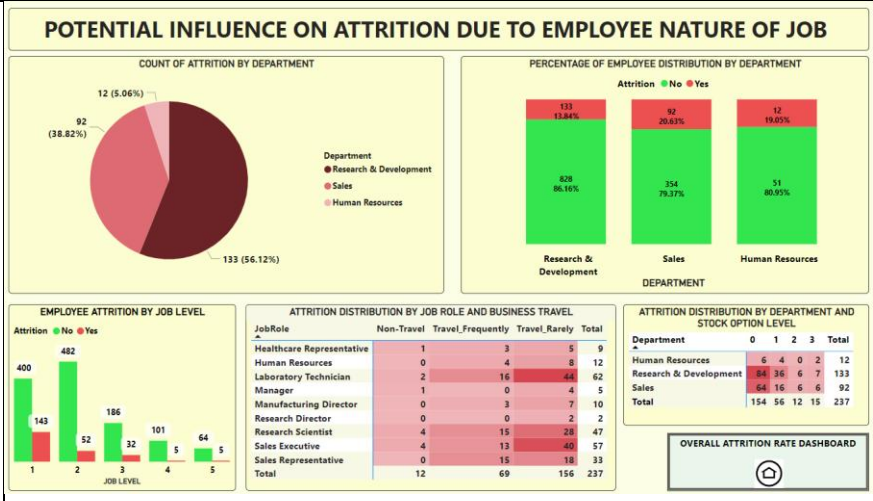
```
1 MIncome_MRate_Intercept = AVERAGE(FactEmployeeAttrition[MonthlyIncome])-(FactEmployeeAttrition[MIncome_MRate_LineSlope] * AVERAGE(FactEmployeeAttrition[MonthlyRate]))
```

| yID | EducationID | FeedbackID | PerformanceID | AttritionCount | MonthlyIncome_MonthlyRate_Ratio | MeanMonthlyRate | Difference_MonthlyRate_MeanMonthlyRate | Me |
|---|---|---|---|---|---|---|---|---|
| 489 | 7 | 94 | 275 | 0 | 66.80% | 14313.1034013605 | -6523.10340136054 | |
| 7 | 7 | 330 | 91 | 0 | 20.01% | 14313.1034013605 | 9500.89659863946 | |
| 7 | 7 | 56 | 308 | 0 | 11.80% | 14313.1034013605 | 5851.89659863946 | |

The line slope stored as calculated measure in MIncome_Mrate_LineSlope is multiplied by the average monthly rate. The resulting value is subtracted from the average monthly income and stored as a calculated measure in a variable named MIncome_Mrate_Intercept

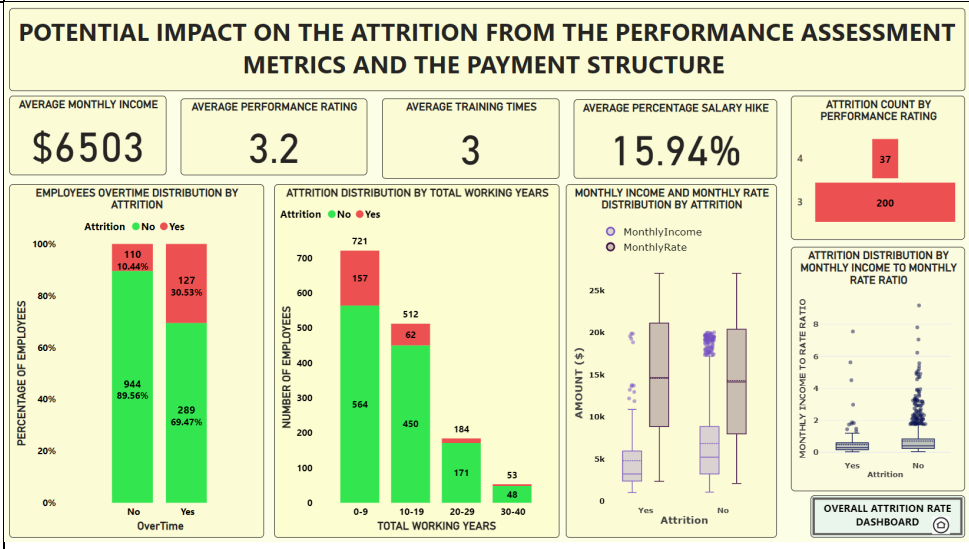
D) Dashboard Design

| | |
|---|---|
| Requirements | Describe the Power BI dashboard (full collection of visuals) and how the content of the Power BI pages is organised.<br>A screenshot of all the pages of the Dashboard must be provided. |
| | The full collection of the visuals are plotted on 6 separate dashboards. |
| | **DASHBOARD - THE OVERALL ATTRITION RATE AND SOME KEY FACTORS POTENTIALLY CONTRIBUTING TO THE OVERALL ATTRITION AND THE ATTRITION RATE** |
| |  |
| | The first dashboard on the first page is the dashboard giving information regarding the overall attrition rate and the potential significant factors affecting the attrition.<br>The attrition slicer on the page has filter effect on all the dashboards except the recommendations and questions and answers dashboard.<br>The first page has 5 buttons that each link the front page to each of the other dashboards on page 2 through page 6.<br>The key influencer chart, decomposition tree chart, the gauge chart and the card visuals are to give insight for the business question 1. |
| | **DASHBOARD - POTENTIAL INFLUENCE ON ATTRITION DUE TO THE EMPLOYEE NATURE OF JOB** |

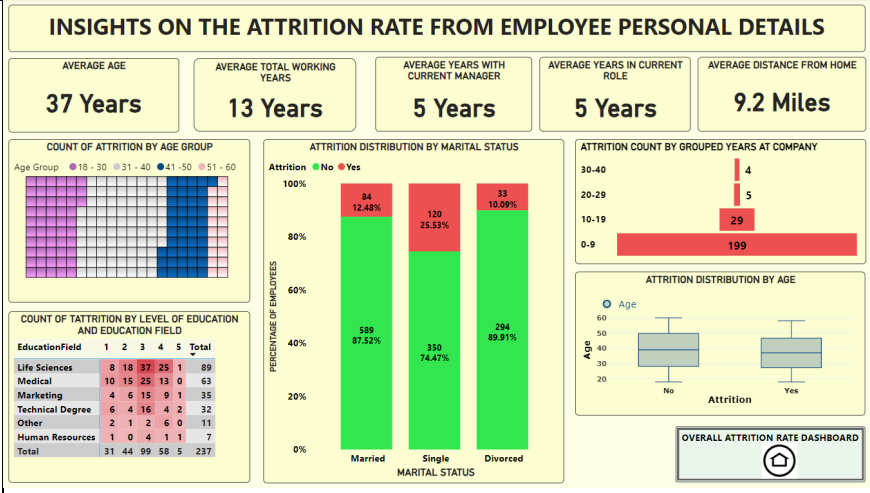
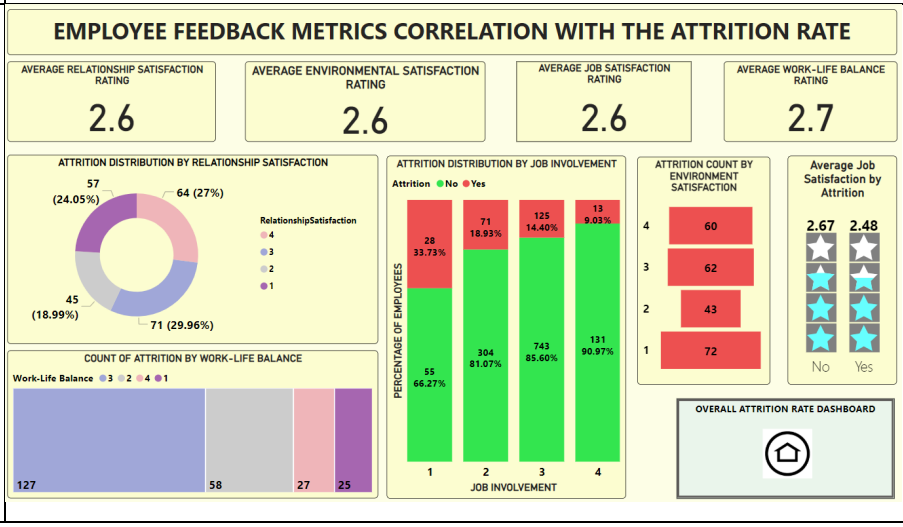


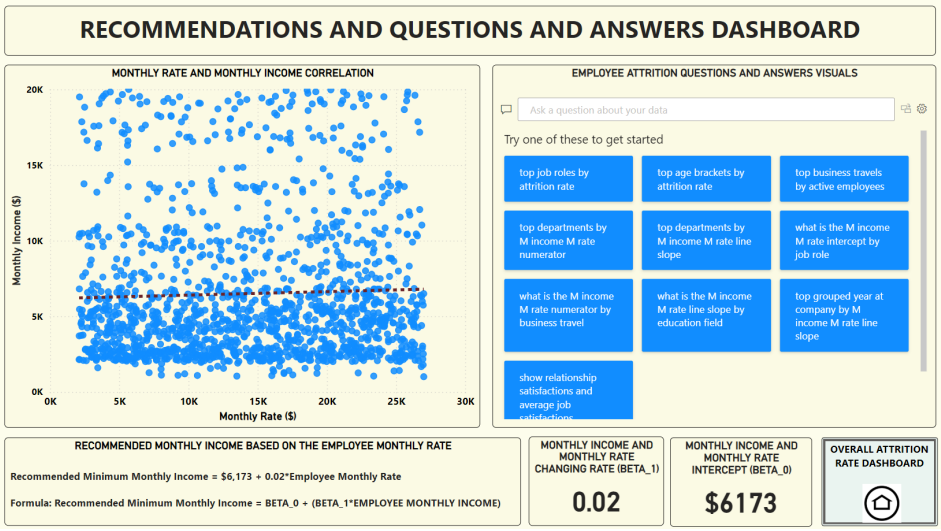

This dashboard is the second page. The pie chart visual, 100% stacked column bar chart, matrix charts and the clustered column chart are plotted to give insight into the potential influence on attrition due to the nature of the job of employees. The button by the lower right side of the dashboard is linked to the home page.

**DASHBOARD - THE POTENTIAL IMPACT ON THE ATTRITION FROM THE PERFORMANCE ASSESSMENT METRICS AND THE PAYMENT STRUCTURE**




**DASHBOARD - THE INSIGHT ON THE ATTRITION FROM THE EMPLOYEE PERSONAL DETAILS, INCLUDING THE EMPLOYEE EDUCATIONAL BACKGROUND AND THE EMPLOYEE PREVIOUS WORK HISTORY**

| | |
|---|---|
| | The funnel chart, card visual, box and whisker plots chart, et cetera are plotted to give insight into the potential impact on the attrition from the performance assessment metrics and the payment structure.<br>The button by the right lower side of the dashboard is an home button, linked to the first page. |
| |  |
| | The charts on the dashboard are plotted to give insight on the attrition rate from employee personal details. The button at the bottom right side of the visual is linked to the front page as the home button. |
| | **DASHBOARD - THE INSIGHT ON THE ATTRITION FROM THE EMPLOYEE FEEDBACK INFORMATION WITH REGARDS TO THE ATTRITION** |
| |  |

| | |
|---|---|
| | The charts on the dashboard are plotted to give insight on the attrition rate from employee personal details. The button at the bottom right side of the visual is linked to the front page as the home button. |
| | **DASHBOARD – RECOMMENDATIONS AND QUESTIONS AND ANSWERS** |
| |  |
| | The button at the bottom right side of the visual is linked to the front page as the home button.<br>The scatter plot chart is plotted to determine the recommended minimum monthly income using the linear regression method. Although, the points are widely dispersed, which suggests a weak relationship between the monthly income and the monthly rate. This chart is plotted because the monthly rate shows little to no statistical difference between the Yes and No categories of employees.<br>The Q&A chart is plotted for the top management to ask questions if needed, without the need to contact me for all their enquiries. |

**REFERENCES**

Gupta, D. (2024) *Employee Attrition, Churn, and Turnover: What's the Difference?* Available at: https://whatfix.com/blog/employee-churn/ (Accessed: 12 December 2024)

Patel, P. (2017) *Employee Attrition; Fictional dataset on HR Employee attrition and performance.* Available at: https://www.kaggle.com/datasets/patelprashant/employee-attrition (Accessed: 20 October 2024).

**SELF-ASSESSMENT**

| **Report Section** | **Description** | **Grade your work from 0 to 100** |
|---|---|---|
| Report Structure | The report is well-written, and it contains all the relevant sections | 92 |
| Data Pre-processing and Data Modelling | Many pre-processing steps have been applied. The data model is well-structured | 95 |
| Dax and M language | Both DAX and M Language have been **extensively** used in the report | 98 |
| Dashboard Design | The dashboard contains a variety of charts, including advanced ones not covered in the module. | 95 |
| **Average** | | **Add below the average of the four cells above:** 95 |