

Project Report Data-Driven HR Analytics for Attrition and Performance

7th July 2025

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Document Version History

| Version Number | Effective Date of release | Details | Author |
|-----------------------|----------------------------------|------------------|---------------|
| 1.0 | 7 July 2025 | Initial Creation | Sujuandy |
| | | | |

1. Project Background

The project titled "*Data-Driven HR Analytics for Attrition and Performance*" focuses on leveraging Power BI to analyze HR-related data, providing actionable insights into employee attrition and performance patterns.

By transforming and modeling real-world HR data, the project aims to simulate a business environment where learners like me, can apply data modeling, DAX, and visualization skills to address real HR concerns.

The dashboards created will support HR departments in making data-informed decisions regarding workforce retention, employee engagement, and performance trends.

This comprehensive project involves multiple activities: data cleaning, calculated column and measure creation, relationship modeling, and designing dynamic and interactive dashboards. The visualizations cover KPIs, demographic trends, performance distribution, and attrition behavior—structured across Overview, Demographics, Performance Tracker, and Attrition pages. Each dashboard page is tailored to meet specific analytical objectives relevant to HR.

2. Project Objective

- **Develop a Comprehensive HR Dashboard:**
Create an interactive Power BI report that visualizes employee attrition and performance metrics across various organizational dimensions.
- **Apply Data Transformation and Modeling Skills:**
Cleanse, enrich, and model multiple HR-related datasets using Power Query and DAX formulas to create calculated columns and meaningful measures.
- **Perform HR Data Analysis for Insight Generation:**
Analyze demographic, departmental, and job role data to identify trends, patterns, and outliers in employee behavior and attrition.
- **Enable Dynamic Filtering and Drill-Down Capabilities:**
Integrate slicers and hierarchies to allow HR decision-makers to explore data across dimensions like Department, Gender, Job Role, and Tenure.
- **Demonstrate Visualization Best Practices:**
Design user-friendly, visually appealing charts, KPIs, gauges, and combined visuals that align with storytelling principles and support HR decision-making.

3. Project Specifications

Tools Used:

- Power BI Desktop: For data import, transformation, modeling, DAX measures, and report visualization.
- Excel: As the source for raw datasets such as employee data, attrition rates, and satisfaction metrics.
- Technical Components:
 - Data Transformation: Using Power Query to cleanse and shape data (e.g., correcting data types, handling nulls, creating Age Bins).
 - Data Modeling: Establishing relationships between multiple tables (e.g., Employee Data, Education, Performance Rating) and optimizing model directionality.
 - Calculated Columns and Measures: Implemented using DAX, including metrics such as %Attrition, Active/Inactive Employees, Average Salary, and Age Categories.
 - Interactive Visualizations: KPI cards, bar/column charts, pie charts, line charts, gauges, and combo charts across different pages with slicers for interactivity.
 - Filtering: Slicers for Employee ID, Gender, Job Level, and Year to enable contextual analysis.

Approach:

- Import and Clean Data – from Excel into Power BI using Power Query.
- Create Calculated Columns – e.g., Age Bin, Tenure Group.
- Build Relationships and Hierarchies – connect and normalize multiple tables.
- Develop Measures and KPIs – using DAX to support analysis.
- Design Visual Pages – Overview, Demographics, Performance, and Attrition with appropriate charts and filters.
- Iterate Based on Feedback – during mentoring sessions to refine layout and usability.

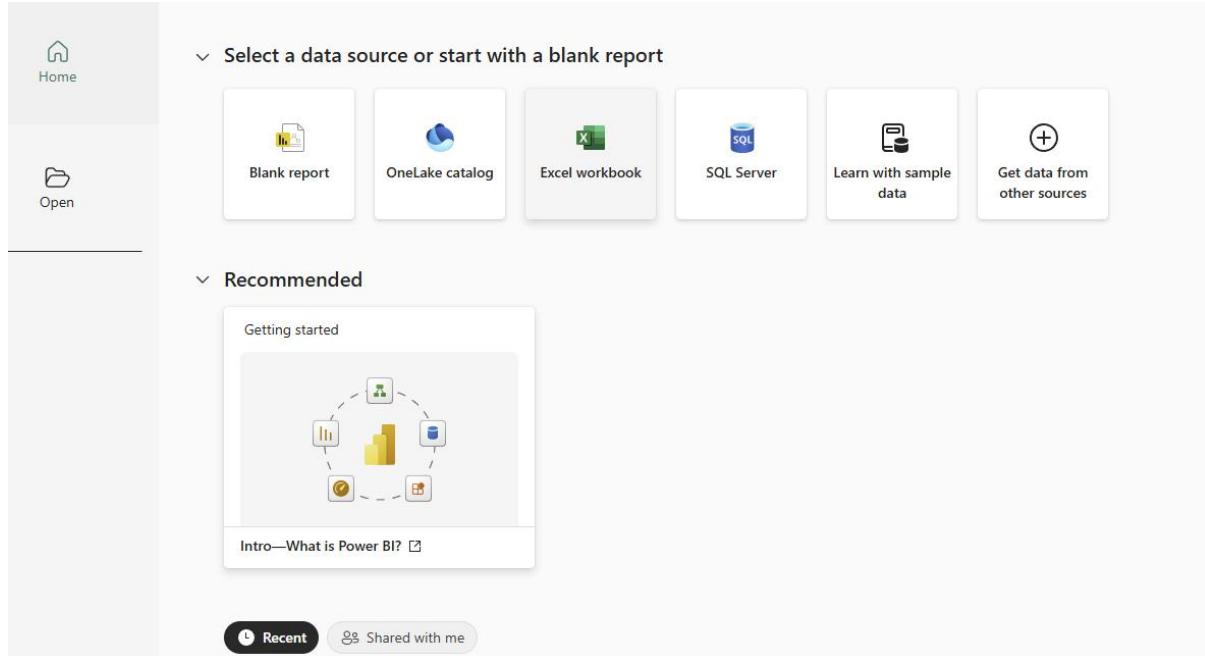
4. Project Tasks

4A. Activity 1

Please include screenshots  and explanations in the provided space below.

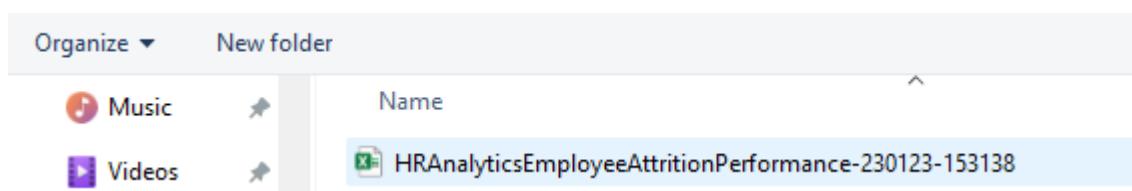
1. Screenshots of Tables

Chose “Excel Workbook” data source



The screenshot shows the Power BI Home screen. On the left, there are navigation icons for Home and Open. The main area has two sections: "Select a data source or start with a blank report" and "Recommended". Under "Select a data source or start with a blank report", there are six options: Blank report, OneLake catalog, Excel workbook (selected), SQL Server, Learn with sample data, and Get data from other sources. Under "Recommended", there is a "Getting started" card with a diagram showing various data types like tables, charts, and databases, and a link to "Intro—What is Power BI?". At the bottom, there are buttons for "Recent" and "Shared with me".

Select “HRAnalyticsEmployeeAttritionPerformance-230123-153138” data source.



The screenshot shows a Windows File Explorer window. The top bar includes "Organize", "New folder", and a search bar. Below is a list of files and folders: "Music" (with a play icon) and "Videos" (with a play icon). The file "HRAnalyticsEmployeeAttritionPerformance-230123-153138" is listed under "Name" and is highlighted with a blue selection bar. It has a small Excel icon next to it.

Load tables "Education", "Attrition Rates", "Employee Data 2018 - 2019", "Job Involvement", "Performance Rating", "Satisfaction",and "WorkLifeBalance" into Power BI.

The screenshot shows the Power BI Navigator interface. On the left, there's a tree view of available tables under the folder 'HRAnalyticsEmployeeAttritionPerformance-23...'. Several tables are checked: Attrition Rates, Education, Employee Data 2018 - 2019, Job Involvement, PerformanceRating, Satisfaction, and WorkLifeBalance. Below this, under 'Suggested Tables [1]', 'Table 1 (Attrition Rates)' is listed. On the right, the 'WorkLifeBalance' table is displayed in a preview grid. The table has two columns: 'WorkLifeBalance ID' and 'WorkLifeBalance Level'. The data rows are: 1 Bad, 2 Good, 3 Better, and 4 Best. At the bottom right are three buttons: 'Load' (highlighted in green), 'Transform Data', and 'Cancel'.

| WorkLifeBalance ID | WorkLifeBalance Level |
|--------------------|-----------------------|
| 1 | Bad |
| 2 | Good |
| 3 | Better |
| 4 | Best |

2. Data Cleaning

Select “Transform Data” & Power Query Editor comes up, now we can perform data validation/checking for data cleaning.

The screenshot shows the Microsoft Power Query Editor interface. On the left, the 'Navigator' pane lists various tables and data sources under the folder 'HRAnalyticsEmployeeAttritionPerformance-23...'. Several tables are selected, indicated by checked checkboxes: Attrition Rates, Data Dictionary, Education, Employee Data 2018 - 2019, Job Involvement, PerformanceRating, Satisfaction, and WorkLifeBalance. Below these, under 'Suggested Tables [1]', is 'Table 1 (Attrition Rates)'. On the right, the 'WorkLifeBalance' table is displayed in a preview grid. The table has two columns: 'WorkLifeBalance ID' and 'WorkLifeBalance Level'. The data rows are: 1 Bad, 2 Good, 3 Better, and 4 Best. At the bottom of the editor are three buttons: 'Load' (green), 'Transform Data' (white), and 'Cancel' (white).

| WorkLifeBalance ID | WorkLifeBalance Level |
|--------------------|-----------------------|
| 1 | Bad |
| 2 | Good |
| 3 | Better |
| 4 | Best |

Power Query Editor, helps me to review and profile the data. It also helps me determine how to clean and transform the data.

In the View ribbon tab, I selected “Column quality” from “Data Preview” group. This helps me to easily determine valid, error or empty values found in columns.

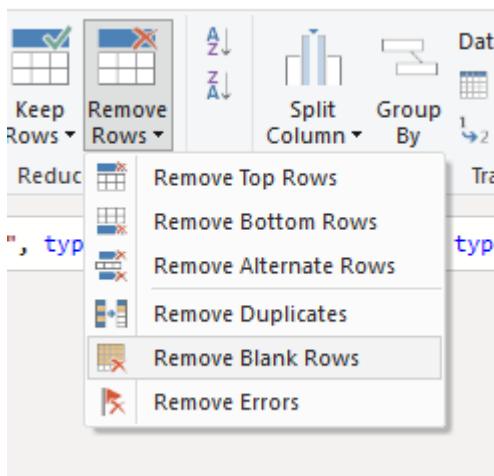
Table “Education” is clean.

| Education Level | Count | Status |
|-----------------|-------|--------|
| Below College | 1 | Valid |
| College | 2 | Valid |
| Bachelor | 3 | Valid |
| Master | 4 | Valid |
| Doctor | 5 | Valid |

Found null values in “Attrition Rates” table.

The screenshot shows the Power BI Data Editor interface. On the left, the 'Queries [7]' pane is open, listing seven queries: Education, Attrition Rates (selected), Employee Data 2018 - 2..., Job Involvement, PerformanceRating, Satisfaction, and WorkLifeBalance. To the right is the 'Preview' pane, which displays a table with two columns: 'Year' and '1.2 Attrition_rate'. The 'Year' column contains dates from 3/31/2016 to 3/31/2020, and the '1.2 Attrition_rate' column contains numerical values (0.1588, 0.1424, 0.4758, 0.1664, 0.1559) followed by a 'null' entry. A status bar at the top indicates the formula: '= Table.TransformColumnTypes(#"Promoted", {{"Year", type date}, {"1.2 Attrition_rate", type number}})'.

I decided to remove the row with “null” values since the row has no analytical value, using “Remove Rows” > “Remove Blank Rows” under Home ribbon tab and Reduce Rows group.



Now Attrition Rate table is cleaned.

The screenshot shows the Power BI Data Editor interface. On the left, under 'Queries [7]', the 'Attrition Rates' query is selected. To the right is the preview pane showing a table with two columns: 'Year' and 'Attrition_rate'. The table has five rows corresponding to the years 2016 through 2020. Each row contains a date in the 'Year' column and a numerical value in the 'Attrition_rate' column. Above the preview pane, there is a formula bar with the text: '= Table.SelectRows(#"Changed Type", each no...".

| | Year | Attrition_rate |
|---|-----------|----------------|
| 1 | 3/31/2016 | 0.1588 |
| 2 | 3/31/2017 | 0.1424 |
| 3 | 3/31/2018 | 0.4758 |
| 4 | 3/31/2019 | 0.1664 |
| 5 | 3/31/2020 | 0.1559 |

The “Employee Data 2018 – 2019” table 999+ columns.

Attrition Rates

Employee Data 2018 - 2...

Job Involvement

PerformanceRating

Satisfaction

WorkLifeBalance

100% ● Valid 100%
0% ● Error 0%
0% ● Empty 0%

| | | | |
|----|----|-------|-----------|
| 1 | 8 | | 3/31/2019 |
| 2 | 10 | | 3/31/2019 |
| 3 | 7 | | 3/31/2019 |
| 4 | 8 | | 3/31/2019 |
| 5 | 6 | | 3/31/2019 |
| 6 | 8 | | 3/31/2019 |
| 7 | 17 | | 3/31/2019 |
| 8 | 6 | | 3/31/2019 |
| 9 | 10 | | 3/31/2019 |
| 10 | 10 | | 3/31/2019 |
| 11 | 5 | | 3/31/2019 |
| 12 | 3 | | 3/31/2019 |
| 13 | 6 | | 3/31/2019 |
| 14 | 10 | | 3/31/2019 |
| 15 | 7 | | 3/31/2019 |
| 16 | 31 | | 3/31/2019 |
| 17 | 6 | | 3/31/2019 |
| 18 | 1 | | 3/31/2019 |
| 19 | 13 | | 3/31/2019 |
| 20 | 0 | | 3/31/2019 |
| 21 | 5 | | 3/31/2019 |
| 22 | 8 | | 3/31/2019 |
| 23 | 26 | | 3/31/2019 |
| 24 | 10 | | 3/31/2019 |
| 25 | 24 | | 3/31/2019 |
| 26 | | < [] | |

999+ COLUMNS, 999+ ROWS Column profiling based on top 1000 rows

1²3 Relationship Satisfaction ABC 123 Column30 ABC 123 Column31 ABC 123 Column32 ABC 123 Column33

100% ● Valid 100% ● Valid 0% ● Valid 0% ● Valid 0% ● Valid
0% ● Error
0% ● Empty 0% ● Empty 100% ● Empty 100% ● Empty 100% ● Empty

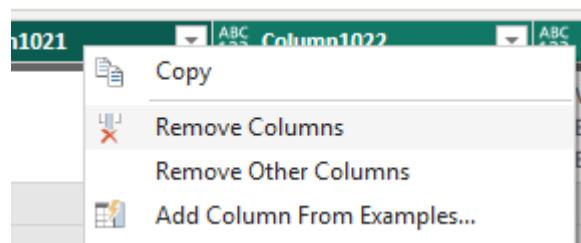
| | | | | |
|---|---|------|------|------|
| 3 | 1 | null | null | null |
| 4 | 4 | null | null | null |
| 3 | 2 | null | null | null |
| 3 | 3 | null | null | null |
| 3 | 4 | null | null | null |

Queries [7]

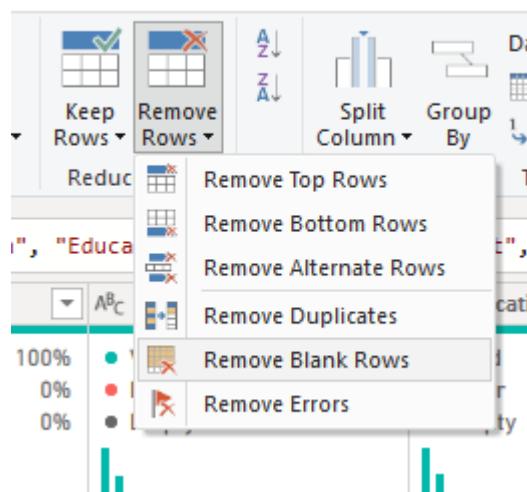
= Table.TransformColumnTypes(#"Promoted Headers", {{"Name", type text}, {"Age", Int64.Type}, {"Gender", type text}, {"MaritalStatus", type text}, {"EducationField",

| | ABC | Column1018 | ABC | Column1019 | ABC | Column1020 | ABC | Column1021 | ABC | Column1022 | ABC | Column1023 | ABC | Column1024 |
|------|------|------------|------|------------|------|------------|------|------------|------|------------|------|------------|------|------------|
| 1017 | 0% | ● Valid |
| | 0% | ● Error |
| | 100% | ● Empty |
| 1 | null | null |
| 2 | null | null |
| 3 | null | null |
| 4 | null | null |
| 5 | null | null |
| 6 | null | null |
| 7 | null | null |
| 8 | null | null |
| 9 | null | null |
| 10 | null | null |
| 11 | null | null |
| 12 | null | null |
| 13 | null | null |
| 14 | null | null |
| 15 | null | null |
| 16 | null | null |
| 17 | null | null |
| 18 | null | null |
| 19 | null | null |
| 20 | null | null |
| 21 | null | null |
| 22 | null | null |
| 23 | null | null |

Select all unwanted columns that contains no data (100% empty), and remove them.



Observed that the table has blank rows. So, I selected “remove blank rows”:



Now Table “Employee Data 2018 – 2019” is clean

| | Name | Age | Gender | MaritalStatus | EducationField | Education | JobLevel | JobRole |
|------|--------------|-----|--------|---------------|------------------|-----------|----------|----------------------|
| 1376 | Employee1376 | 32 | Female | Single | Life Sciences | | 2 | 1 Research Scientist |
| 1377 | Employee1377 | 46 | Female | Divorced | Life Sciences | | 4 | 2 Research Scientist |
| 1378 | Employee1378 | 49 | Male | Married | Life Sciences | | 1 | 5 Research Director |
| 1379 | Employee1379 | 40 | Male | Married | Technical Degree | | 4 | 3 Healthcare Represe |
| 1380 | Employee1380 | 27 | Female | Married | Human Resources | | 3 | 1 Human Resources |
| 1381 | Employee1381 | 35 | Male | Single | Technical Degree | | 3 | 3 Sales Executive |

Table “Job Involvement” is clean

| | Job Involvement ID | Job Involvement Level |
|---|--------------------|-----------------------|
| | Valid | 100% |
| | Error | 0% |
| | Empty | 0% |
| 1 | 1 | Low |
| 2 | 2 | Medium |
| 3 | 3 | High |
| 4 | 4 | Very High |

Table “Performance Rating” is clean

| | Performance ID | Performance Rating Level |
|---|----------------|--------------------------|
| | Valid | 100% |
| | Error | 0% |
| | Empty | 0% |
| 1 | 1 | Low |
| 2 | 2 | Good |
| 3 | 3 | Excellent |
| 4 | 4 | Outstanding |

Table “Satisfaction” is clean

The screenshot shows the Power BI Data Preview pane with the following details:

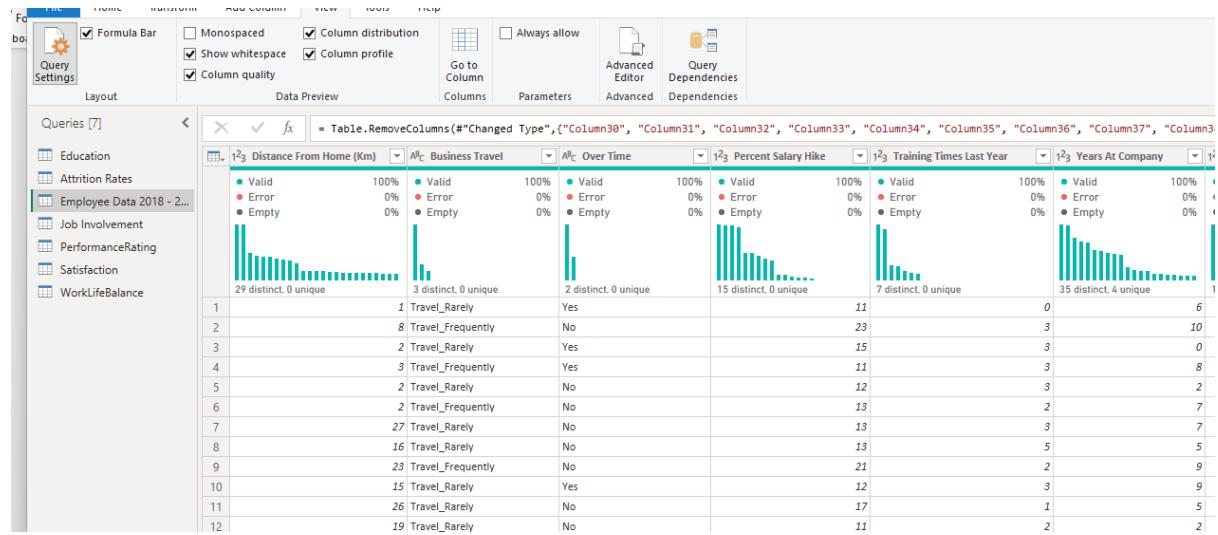
- Queries [7]:** A list of seven queries: Education, Attrition Rates, Employee Data 2018 - 2..., Job Involvement, PerformanceRating, Satisfaction, and WorkLifeBalance. The Satisfaction query is currently selected.
- Data Preview:** The preview pane displays the data for the Satisfaction table. The table has two columns: Satisfaction ID and Satisfaction Level.
- Column Headers:** The first row shows the column headers: Satisfaction ID and Satisfaction Level.
- Data Rows:** There are four rows of data:
 - Row 1: Satisfaction ID 1, Satisfaction Level Low
 - Row 2: Satisfaction ID 2, Satisfaction Level Medium
 - Row 3: Satisfaction ID 3, Satisfaction Level High
 - Row 4: Satisfaction ID 4, Satisfaction Level Very High
- Validation Summary:** Below the table, a summary shows the count of Valid, Error, and Empty values for both columns.

Table “WorkLifeBalance” is clean

The screenshot shows the Power BI Data Preview pane with the following details:

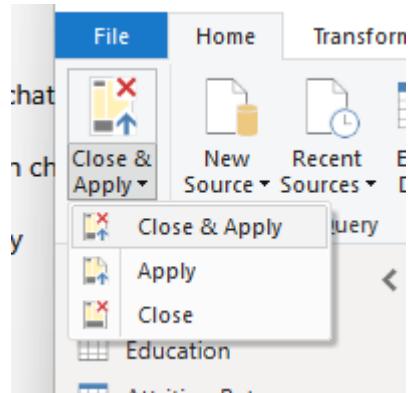
- Queries [7]:** A list of seven queries: Education, Attrition Rates, Employee Data 2018 - 2..., Job Involvement, PerformanceRating, Satisfaction, and WorkLifeBalance. The WorkLifeBalance query is currently selected.
- Data Preview:** The preview pane displays the data for the WorkLifeBalance table. The table has two columns: WorkLifeBalance ID and WorkLifeBalance Level.
- Column Headers:** The first row shows the column headers: WorkLifeBalance ID and WorkLifeBalance Level.
- Data Rows:** There are four rows of data:
 - Row 1: WorkLifeBalance ID 1, WorkLifeBalance Level Bad
 - Row 2: WorkLifeBalance ID 2, WorkLifeBalance Level Good
 - Row 3: WorkLifeBalance ID 3, WorkLifeBalance Level Better
 - Row 4: WorkLifeBalance ID 4, WorkLifeBalance Level Best
- Validation Summary:** Below the table, a summary shows the count of Valid, Error, and Empty values for both columns.

Selected “Column distribution” and “Column Profile” options, to check if there are any possible redundant data, looks like there is none.



3. Data Transformations Applied

Satisfied with the data now, I applied data transformation.



Once Data Transformation is complete, I performed a quick check to confirm that the rows with null values in “Attrition Rates” table have been removed. All good.

| Year | Attrition_rate |
|--------------------------|----------------|
| Thursday, March 31, 2016 | 0.1588 |
| Friday, March 31, 2017 | 0.1424 |
| Saturday, March 31, 2018 | 0.4758 |
| Sunday, March 31, 2019 | 0.1664 |
| Tuesday, March 31, 2020 | 0.1559 |

4. Created Columns and Measures

Create a “Measures” table

Home Insert Modeling View Optimize Help Table tools

MeasureTable

Manage relationships New visual calculation New measure measure column New table Mark as date table

Structure Relationships

c1 MeasureTable = DATATABLE("Name", STRING, [TotalEmployees], 100)

Write a DAX expression to create a new table.

Attrition measure:

| Structure | Formatting | Properties |
|-----------|---|-----------------|
| | | measure measure |
| | | Calculations |
| | 1 %Attrition = DIVIDE([InactiveEmployees],[TotalEmployees]) * 100 | |

Active Employees measure:

| Structure | Formatting | Properties | measure measure |
|-----------|------------|------------|---|
| | | | Calculations |
| | | | |
| | | | ActiveEmployees = CALCULATE([TotalEmployees],FILTER('Employee Data 2018 - 2019','Employee Data 2018 - 2019'[Attrition] = "No")) |

Inactive Employees measure:

```
Structure | Formatting | Properties | Calculations  
1 InactiveEmployees = CALCULATE([TotalEmployees],FILTER('Employee Data 2018 - 2019','Employee Data 2018 - 2019'[Attrition]="Yes"))
```

Total employees measure:

```
Structure | Formatting | Properties  
1 TotalEmployees = DISTINCTCOUNTNOBLANK('Employee Data 2018 - 2019'[Name])
```

Performed a quick check that the measures are correct using card, and cross reference with xls using pivot table.

The screenshot shows the Power BI desktop interface. At the top, there are tabs: Clipboard, Data, Queries, Insert, Calculations, Sensitivity, Share, and Copilot. Below these are four cards displaying numerical values:

- 1470 (TotalEmployees)
- 1233 (ActiveEmployees)
- 237 (InactiveEmployees)
- 16.12 (%Attrition)

To the right of the cards is the Data pane, which contains a tree view of data sources and tables. The 'MeasureTable' node is expanded, showing the following fields:

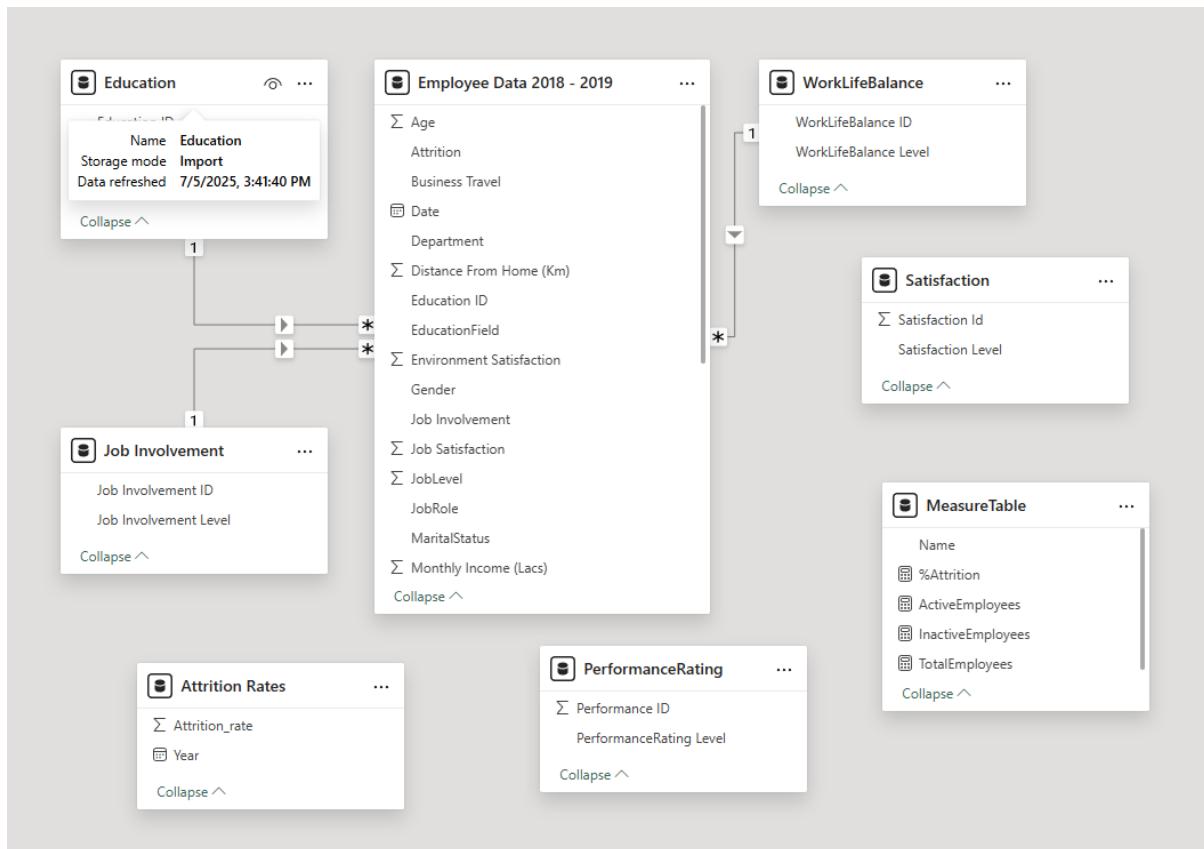
- Attrition
- ActiveEmployees
- InactiveEmployees
- Name
- TotalEmployees

4B Activity 2

Please include screenshots  and explanations in the provided space below.

1. Data Model

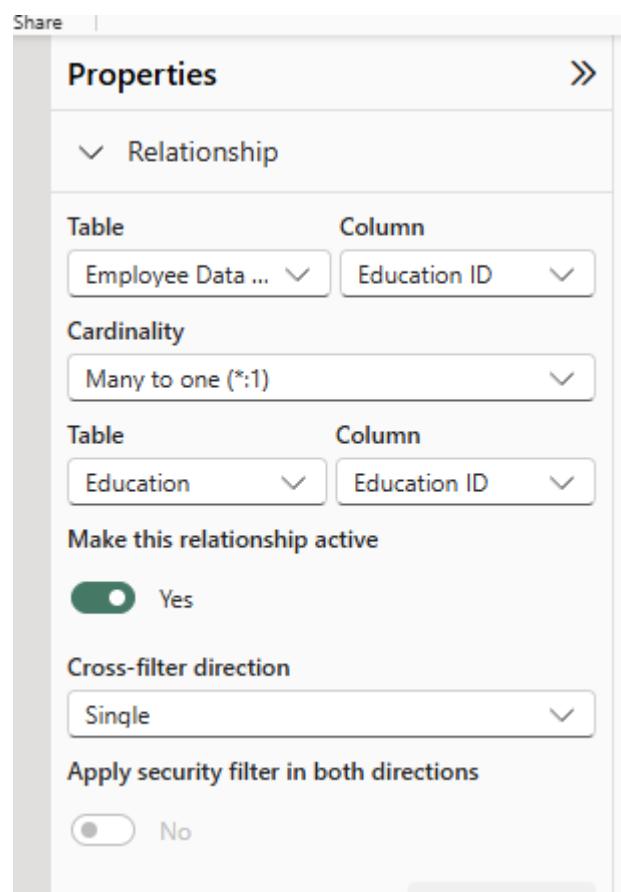
Check Data model:



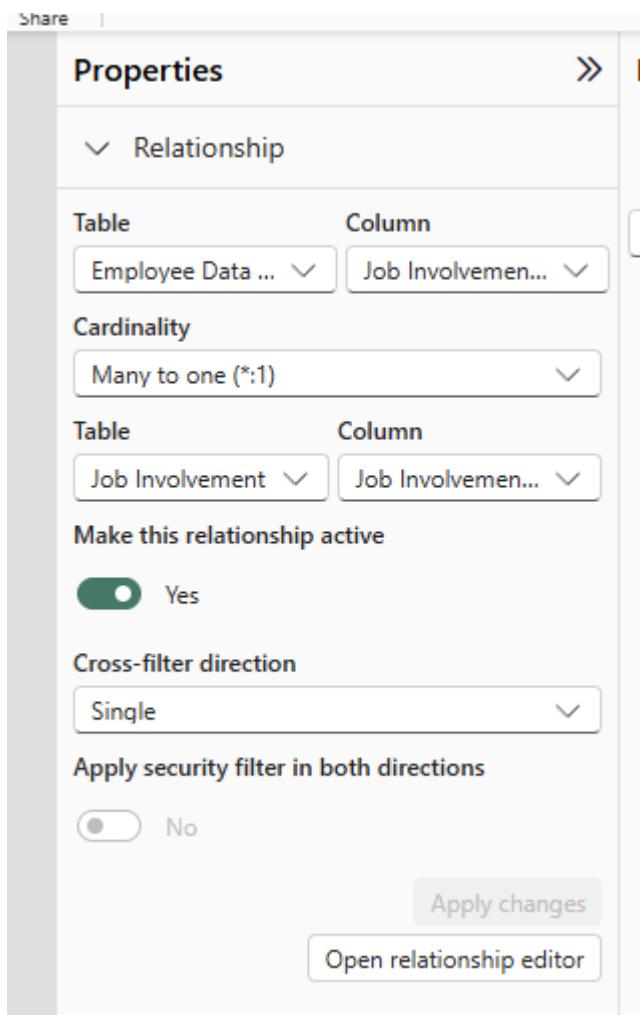
2. Data Relationships

Rename “Education” to “Education ID” for consistency in “Employee Data 2018-2019” table. This matches the “Education” table naming convention, for consistency.

“Education” to “Employee Data” on “Education” done:



"Job Involvement" (renamed to Job Involvement ID) to "Employee Data" on "Job Involvement ID" done:



"Performance Rating"(renamed to Performance Rating ID) to "Employee Data" on "Performance ID" (renamed to Performance Rating ID) done:

The screenshot shows the Power BI Data Model view. A modal dialog titled "New relationship" is open, prompting the user to "Select tables and columns that are related".

From table: PerformanceRating

| Performance ... | PerformanceR... |
|-----------------|-----------------|
| 1 | Low |
| 2 | Good |
| 3 | Excellent |

To table: Employee Data 2018 - 2019

| Performance ... | Relationship ... | TotalWorking... | Training Time... | Work Life Bal... | Years At Com... | Years In G... |
|-----------------|------------------|-----------------|------------------|------------------|-----------------|---------------|
| 3 | 3 | 1 | 3 | 3 | 1 | 0 |
| 3 | 4 | 1 | 6 | 3 | 1 | 0 |
| 3 | 4 | 23 | 2 | 3 | 1 | 0 |

Cardinality: One to many (1:*)

Cross-filter direction: Single

Make this relationship active

Assume referential integrity

Apply security filter in both directions

Buttons: Save (green), Cancel

The left sidebar lists various tables and their columns, including "Employee Data 2018 - 2019" and "PerformanceRating". The "PerformanceRating" table is currently selected.

"Satisfaction" (renamed to Job Satisfaction ID) to "Employee Data" on "Satisfaction Id" (renamed to Job Satisfaction ID) done:

The screenshot shows the Power BI Relationships dialog box. On the left, the 'Employee Data 2018 - 2019' table is listed with columns: EducationField, Environment Satisfaction, Gender, Job Involvement ID, Job Satisfaction ID, JobLevel, JobRole, MaritalStatus, Monthly Income (Lacs), Name, NumCompaniesWorked, Over Time, Percent Salary Hike, Performance Rating ID, Relationship Satisfaction, and TotalWorkingYears. A 'Collapse ^' button is also present. Below the table, a relationship diagram shows a many-to-one relationship between the 'Employee Data 2018 - 2019' table and the 'PerformanceRating' table, with the relationship name '1' and the cardinality '1:N'. The 'PerformanceRating' table has columns: Performance Rating and PerformanceRating. A 'Collapse ^' button is also present.

New relationship

Select tables and columns that are related.

From table

Satisfaction

| Job Satisfaction... | Satisfaction L... |
|---------------------|-------------------|
| 1 | Low |
| 2 | Medium |
| 3 | High |

To table

Employee Data 2018 - 2019

| Job Satisfaction... | JobLevel | JobRole | MaritalStatus | Monthly Inco... | Name | NumCom... |
|---------------------|----------|------------------|---------------|-----------------|------------|-----------|
| 4 | 1 | Laboratory Te... | Divorced | 0.3658125 | Employee37 | 1 |
| 1 | 1 | Laboratory Te... | Divorced | 0.4389375 | Employee38 | 1 |
| 3 | 3 | Laboratory Te... | Single | 1.0089375 | Employee43 | 9 |

Cardinality

One to many (1:N)

Cross-filter direction

Single

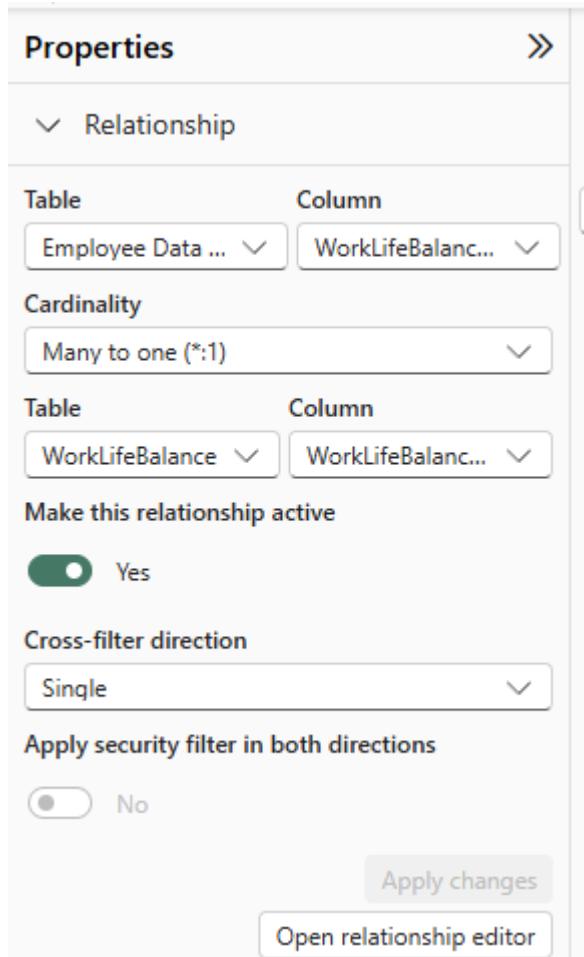
Make this relationship active

Apply security filter in both directions

Assume referential integrity

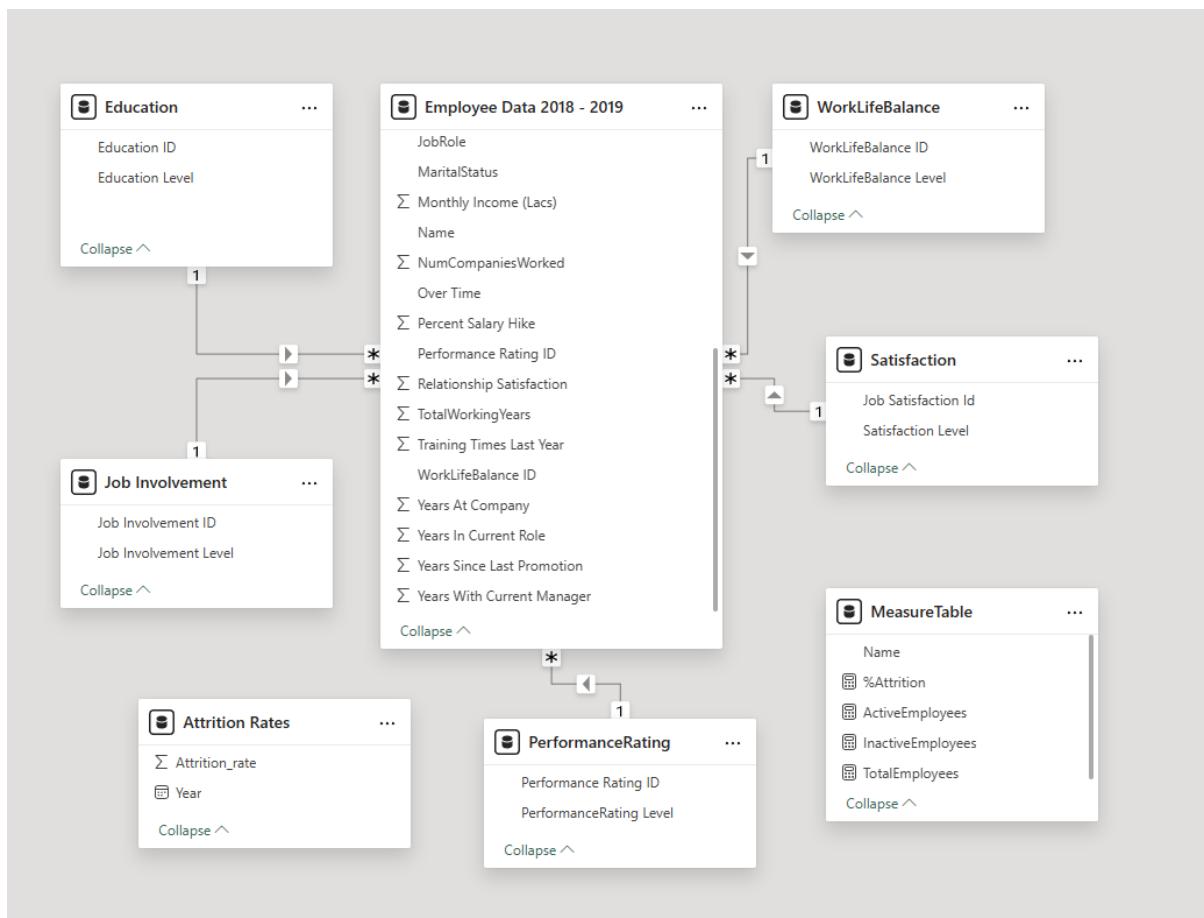
Save **Cancel**

"WorkLifeBalance" (renamed to WorkLifeBalance ID) to "Employee Data" on "WorkLifeBalance ID" done:



Completed Relationship:

Relationships between tables are crucial for building accurate, interactive, and scalable reports. They allow the data model to function like a relational database, enabling us to analyze and visualize data from multiple tables seamlessly.

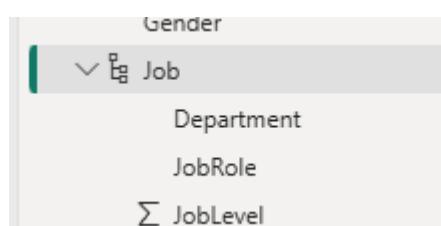


3. Created Hierarchies

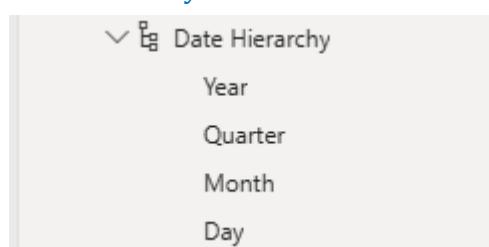
Hierarchies are useful in report view for the following:

- Slicers for multi-level filtering
- Bar/Column charts for drill-down/roll-up
- Matrix visuals for hierarchical reporting

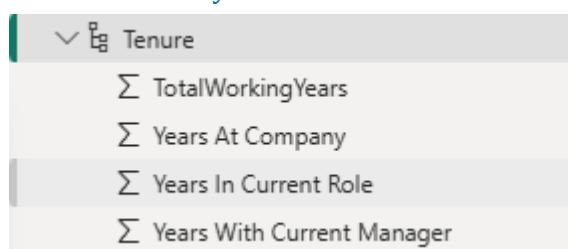
Created a Department Hierarchy, and renamed it to “Job”, then include “Department” , “JobRole” & “JobLevel” into the “Job” hierarchy.



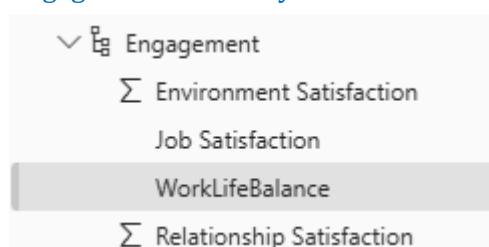
Date Hierarchy is created:



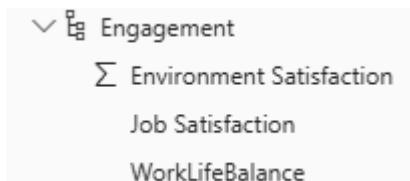
Tenure hierarchy is created:



Engagement hierarchy is created:



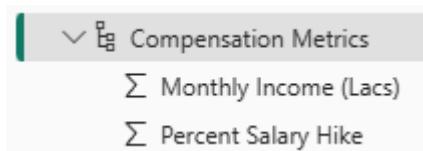
Engagement hierarchy is created:



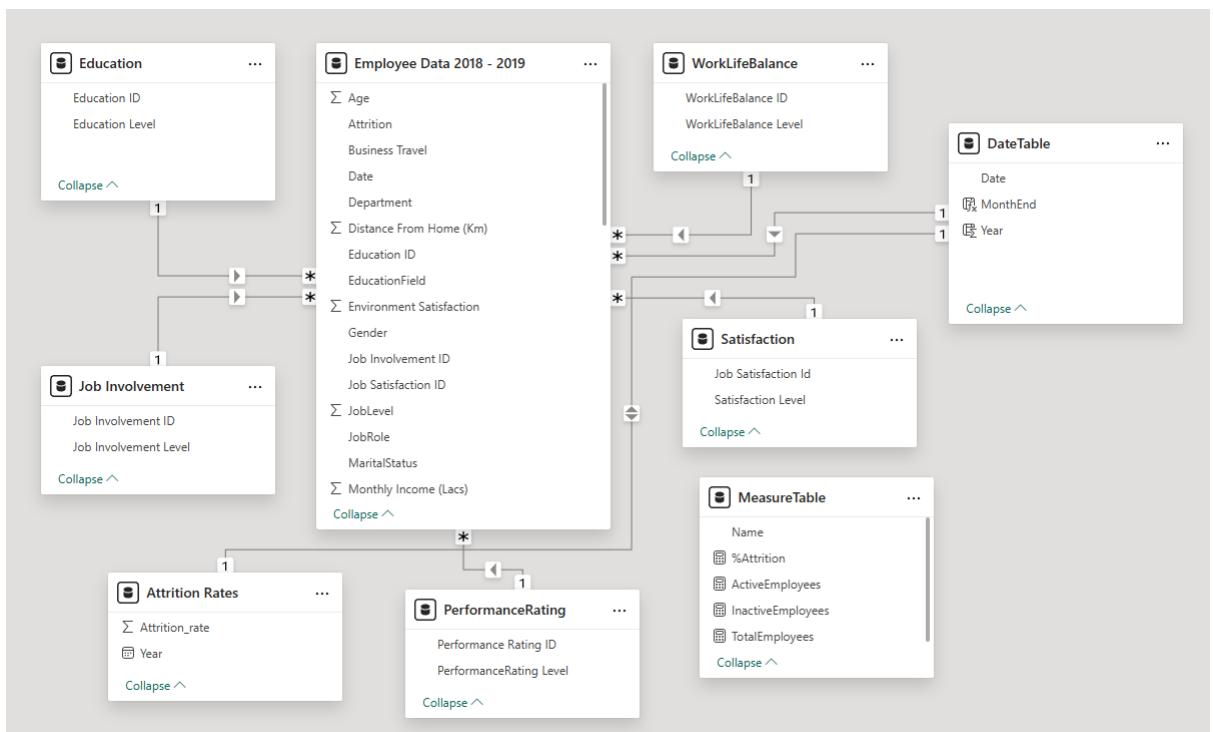
Education hierarchy is created:



Compensation metrics hierarchy is created:



Optimize Model: I have created a DateTable and created relationships with "Employee Data 2018-2019" as well as "Attrition Rates" table.



4C Activity 3

Please include screenshots  and explanations in the provided space below.

1. KPI Cards

Added cards and use measures created earlier for the KPI cards

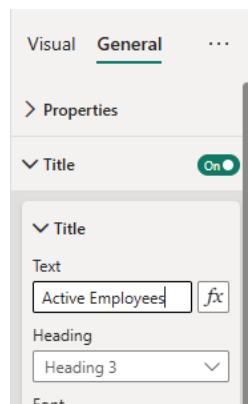


Example of the default card

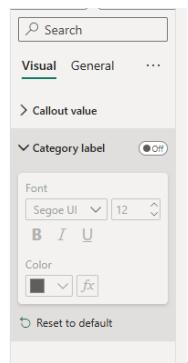
1233

ActiveEmployees

I decided to make some changes to the format. I decided to make use of the Title in General Tab of Visual formatting.



, and turn off Category label.



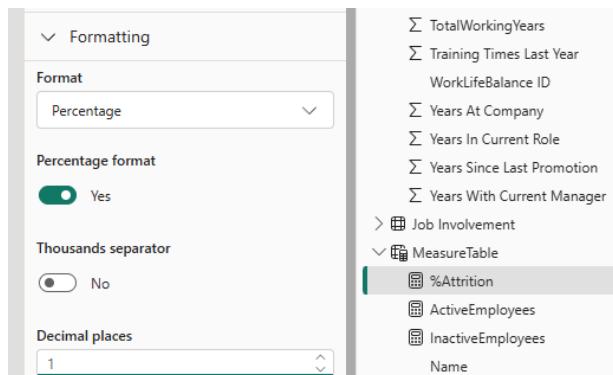
it gives a cleaner look



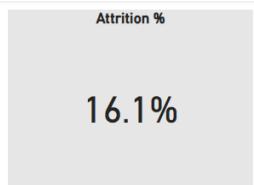
I find that now the KPI cards has clear and user friendly titles, evenly spaced with bold numbers standing out providing emphasis to the report, cards have matching sizes, alignment and background. Lastly, visually there is balance.



I made changes to the format

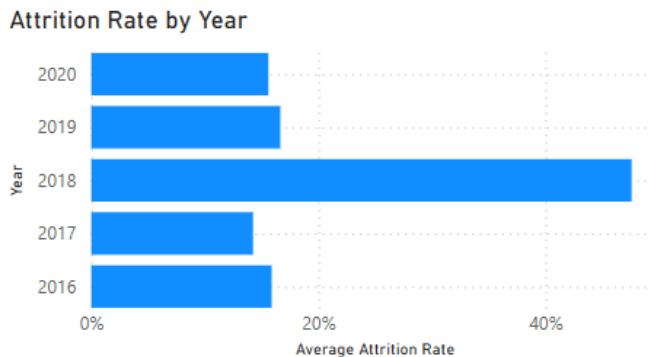


Reducing it to 1 decimal place.

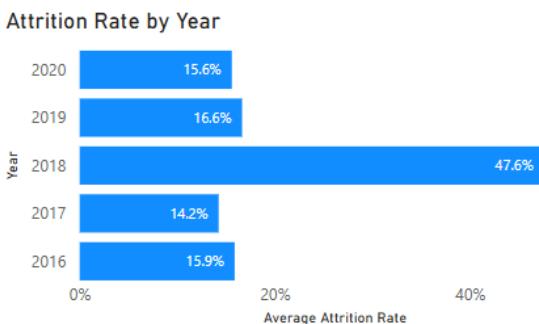


2. Bar Chart

Bar chart created, decided to rename title to “Attrition Rate by Year” to simplify it. I have decided to use average attrition rate by adding another measure in the “Measure Table”. I have also made formatting change in model view, for the “average attrition rate” measure format to percentage, 1 decimal place.

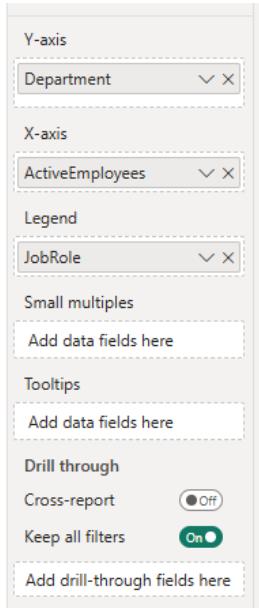


I have also removed the gridlines and turned on “Data Labels” for ease of viewing

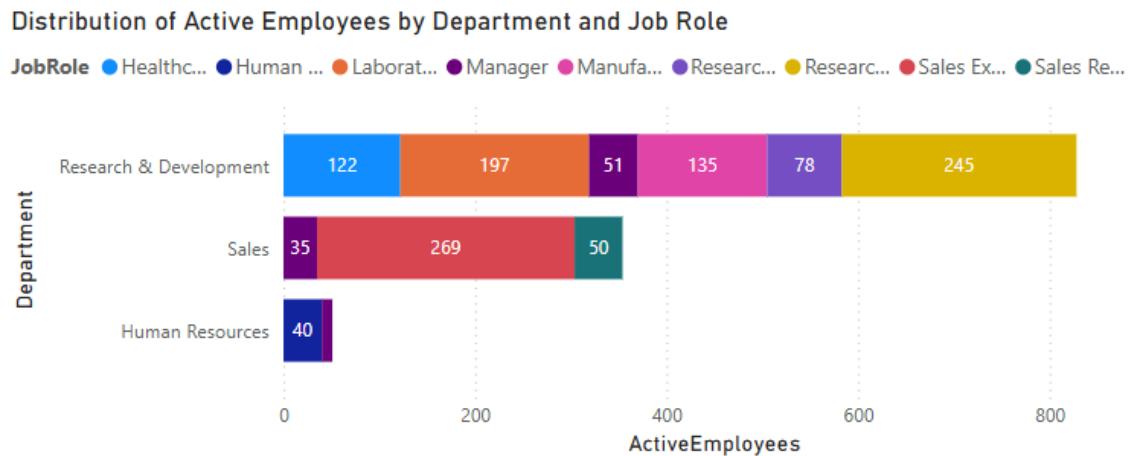


3. Stacked Bar Chart

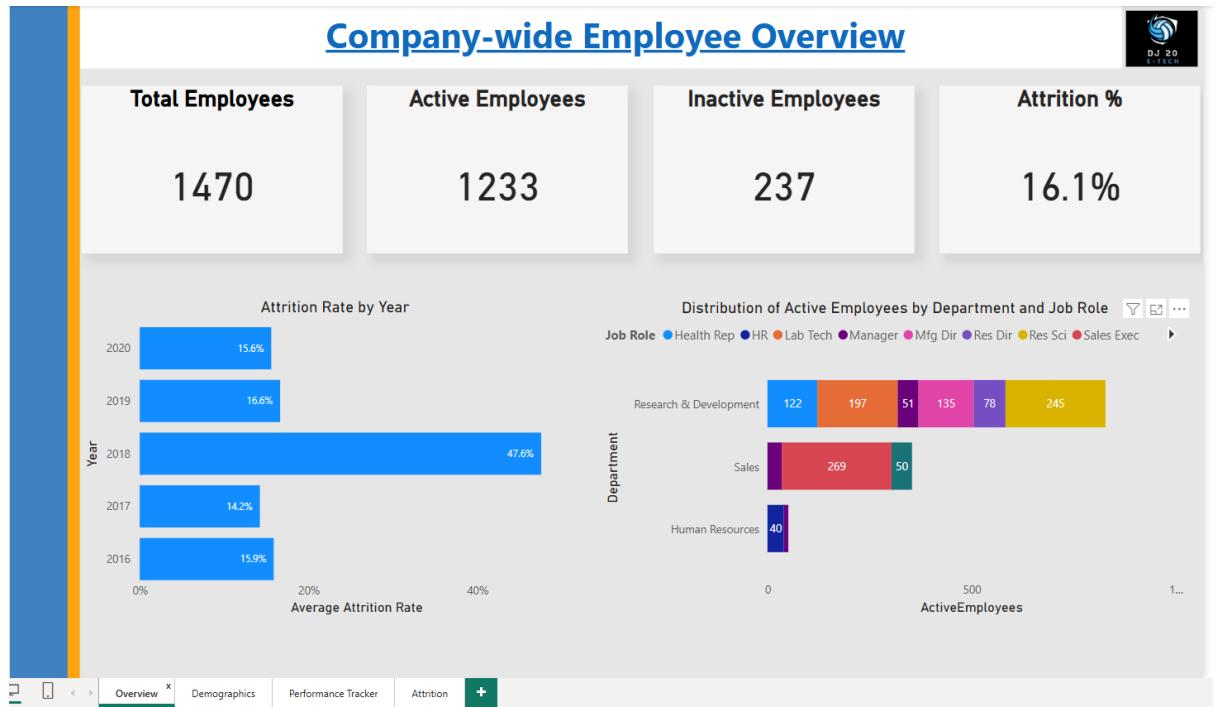
Selected stacked bar chart from visualization, and dragged “Department” to Y-axis, “ActiveEmployees” to X-Axis, and “JobRole” to Legend.



I turned on Data Label from format pane, and changed the title to something more reader-friendly “Distribution of Active Employees by Department and Job Role”.



This is the “Overview” page after some fine-tuning:



4D. Activity 4

Please include screenshots  and explanations in the provided space below.

1. KPI Cards for Demographics Page.

I created a new measures in “Measure table”; “YoungestEmployeeAge” and “OldestEmployeeAge”:



```
1 YoungestEmployeeAge = MIN([Employee[Age]])
1 OldestEmployeeAge = MAX('Employee Data 2018 - 2019'[Age])
```

Then, I created KPI cards by copy/pasting visuals from the “Overview” tab, and editing the visuals.

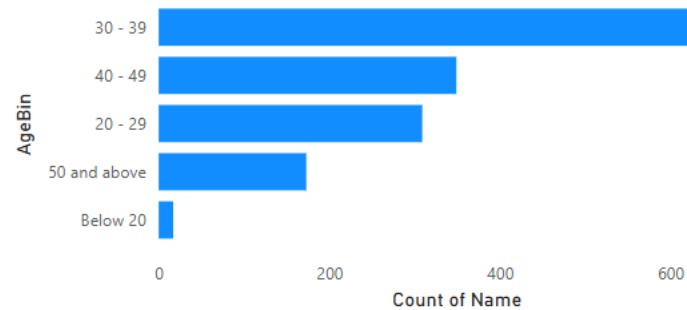


2. Bar Chart.

Created a new column (with DAX) for AgeBin

```
AgeBin =  
SWITCH(  
    TRUE(),  
    'Employee Data 2018 - 2019'[Age] < 20, "Below 20",  
    'Employee Data 2018 - 2019'[Age] >= 20 && 'Employee Data 2018 - 2019'[Age] <= 29, "20 - 29",  
    'Employee Data 2018 - 2019'[Age] >= 30 && 'Employee Data 2018 - 2019'[Age] <= 39, "30 - 39",  
    'Employee Data 2018 - 2019'[Age] >= 40 && 'Employee Data 2018 - 2019'[Age] <= 49, "40 - 49",  
    'Employee Data 2018 - 2019'[Age] >= 50, "50 and above",  
    "Unknown"  
)
```

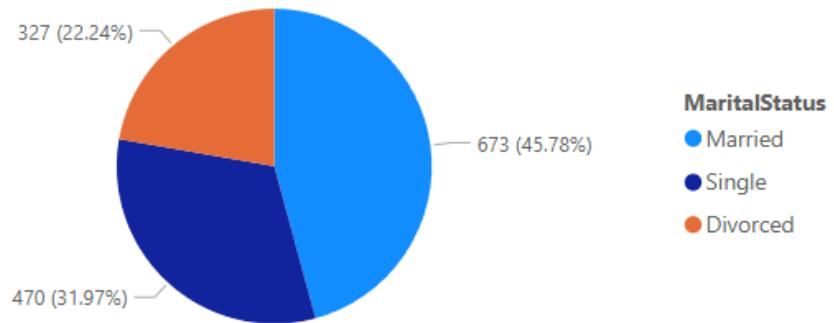
Employees by Age groups



3. Pie Chart.

Created a pie chart for "Employees by MaritalStatus".

Employees by MaritalStatus



4. Combined Chart.

Constructed a combined bar and line chart for "Employees Average Salary by AgeBin, Department, and JobRole". The challenge I encountered is I am not able to combine both Department and Job Role into a single chart, hence I have decided to create a "view by" table that allows me to toggle between the two in the same page. I have also decided to edit the chart titles, Y-axis and X-axis titles, as well as show the currency label.

Screenshot of a software interface showing a "View by" configuration panel. The top section displays a code snippet:

```
1 View by = {
2     ("Department", NAMEOF('Employee Data 2018 - 2019'[Department]), 0),
3     ("JobRole", NAMEOF('Employee Data 2018 - 2019'[JobRoleShort]), 1)
4 }
```

The bottom section shows a table with three rows:

| View by | View by Fields | View by Order |
|------------|---|---------------|
| Department | 'Employee Data 2018 - 2019'[Department] | 0 |
| JobRole | 'Employee Data 2018 - 2019'[JobRoleShort] | 1 |

Filter bar chart by Department or Job role

Department

JobRole

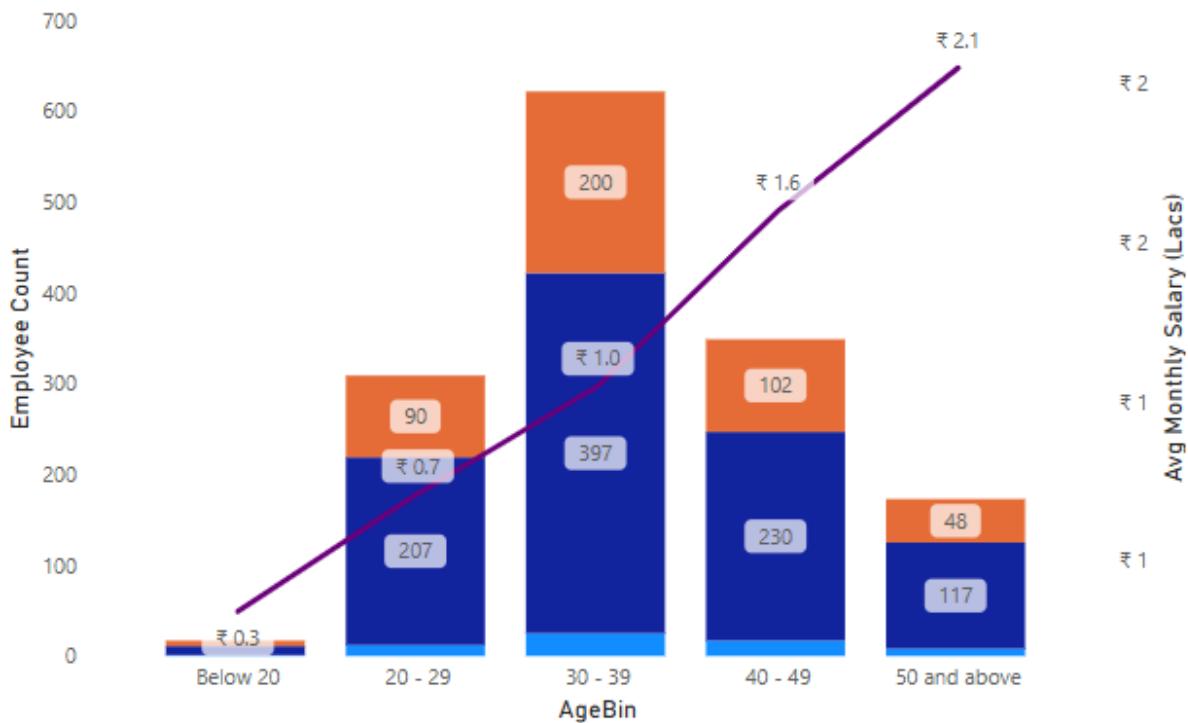


...

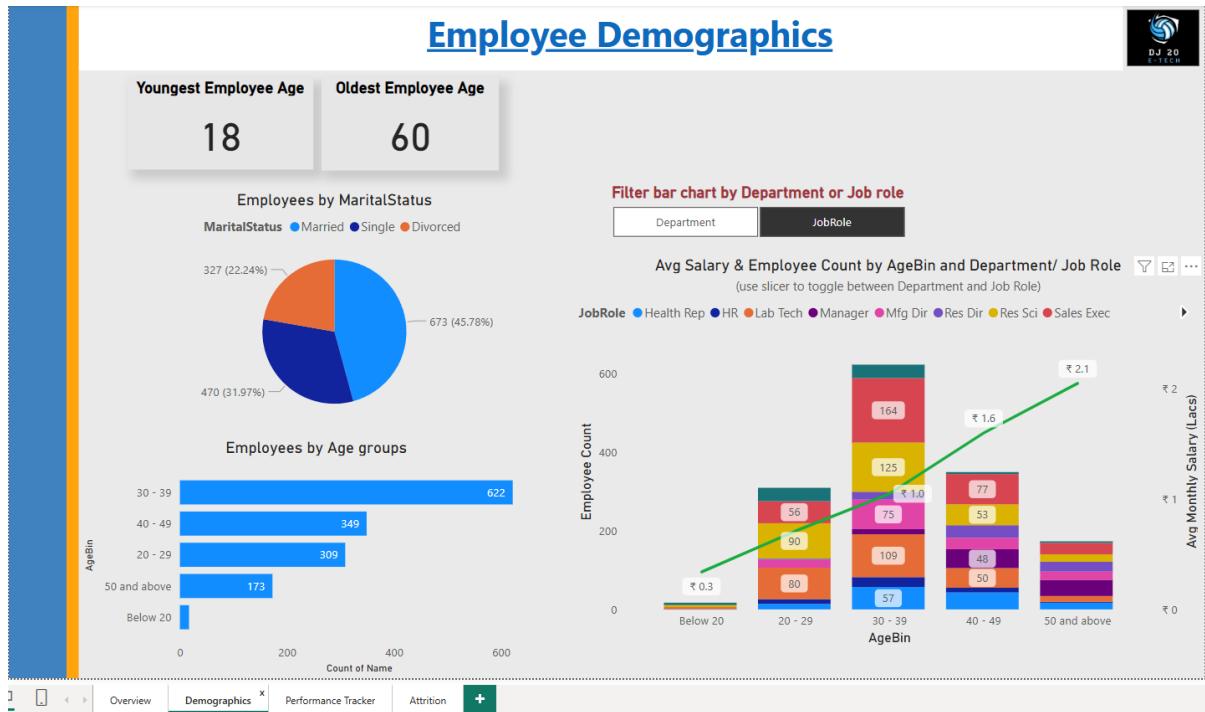
Avg Salary & Employee Count by AgeBin and Department/ Job Role

(use slicer to toggle between Department and Job Role)

Department ● Human Resources ● Research & Development ● Sales ● Average of Monthly Income (Lacs)



This is the “Demographics” page after some fine-tuning:

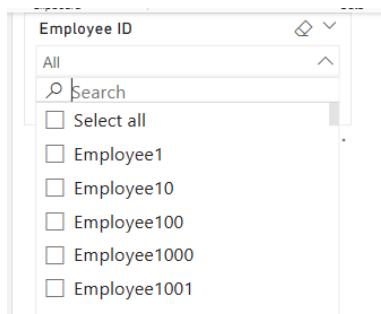


4E. Activity 5

Please include screenshots  and explanations in the provided space below.

1. Filter Slicers.

Implemented slicers for filtering based on "EmployeeID". The table does not have EmployeeID, so I used the column "Name" from the "Employee Data 2018 – 2019" table. I have also enabled

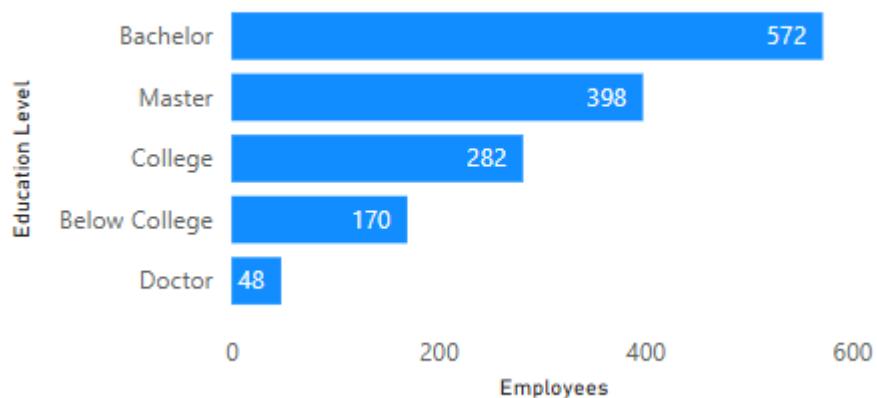


search for easier filtering if needed.

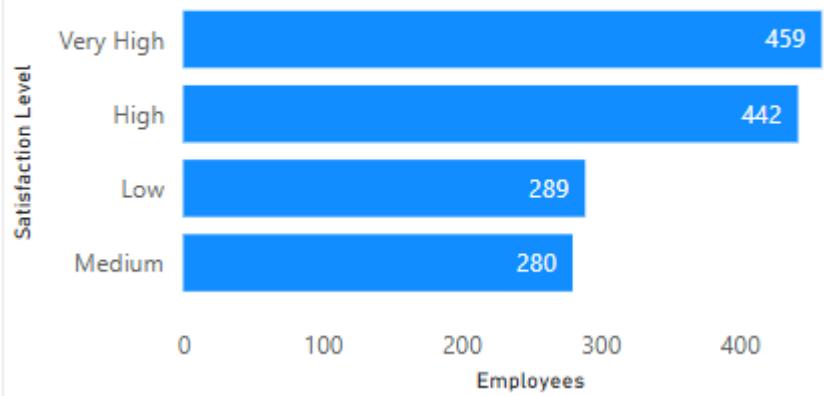
2. Bar Chart

I developed bar charts to show counts or max values for "Education", "Job Satisfaction", "Job Involvement", "Relationship Satisfaction", "Performance Rating", "Work Life Balance", and "Environment Satisfaction".

Employees by Education Level



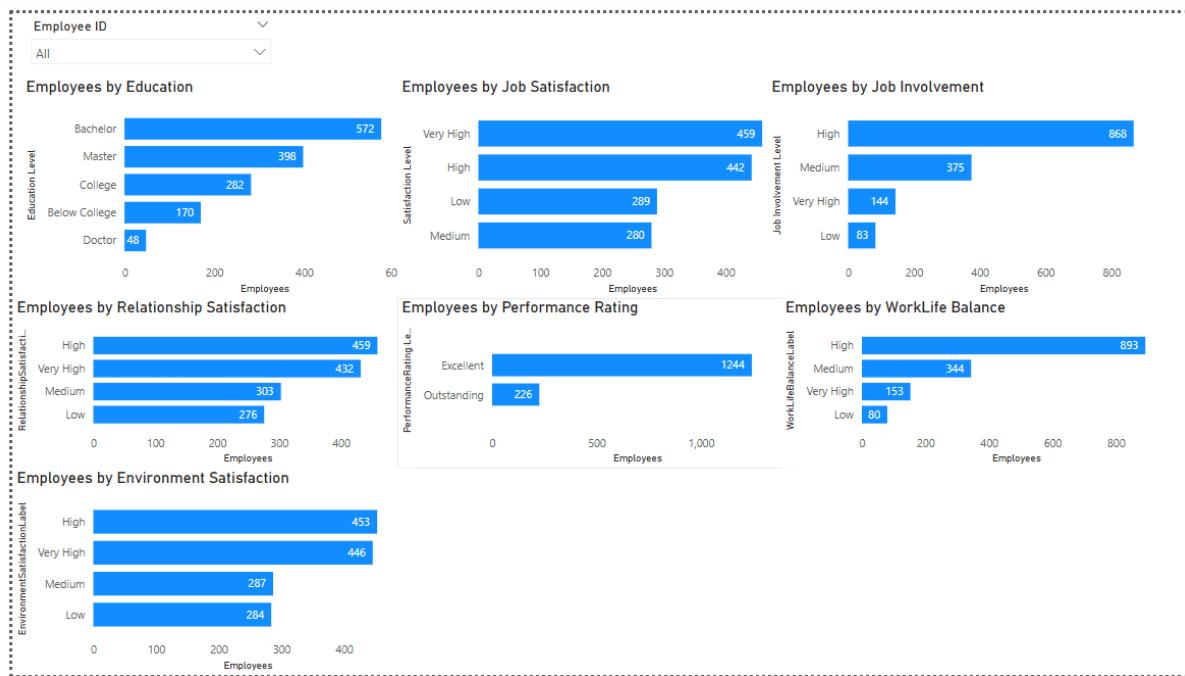
Employees by Job Satisfaction Level



I created new columns to show labels for levels for Relationship Satisfaction, Work Life Balance, and Employment satisfaction, like this (as an example)

```
structure          |      formulaung
1 RelationshipSatisfactionLabel = |
2 SWITCH(           |
3   | Relationship Satisfaction, |
4   | 1, "Low",                |
5   | 2, "Medium",              |
6   | 3, "High",                |
7   | 4, "Very High",           |
8   | "Unknown"                 |
9 )                  |
10
```

These are the bar charts created

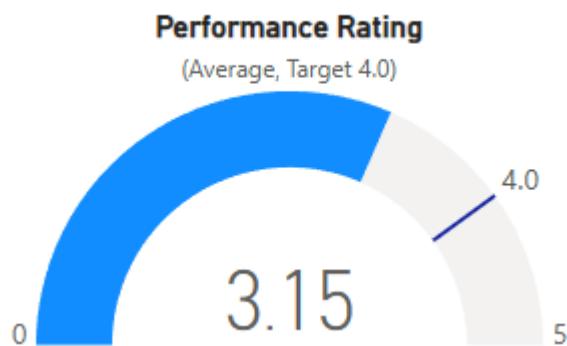


3. Gauges

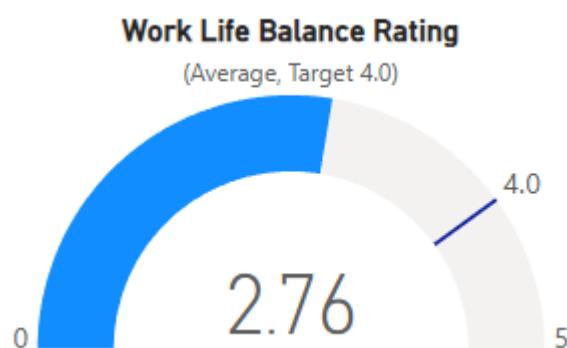
I created a new measure to show Average Performance rating, and had the same done for Average WorkLifeBalance rating.



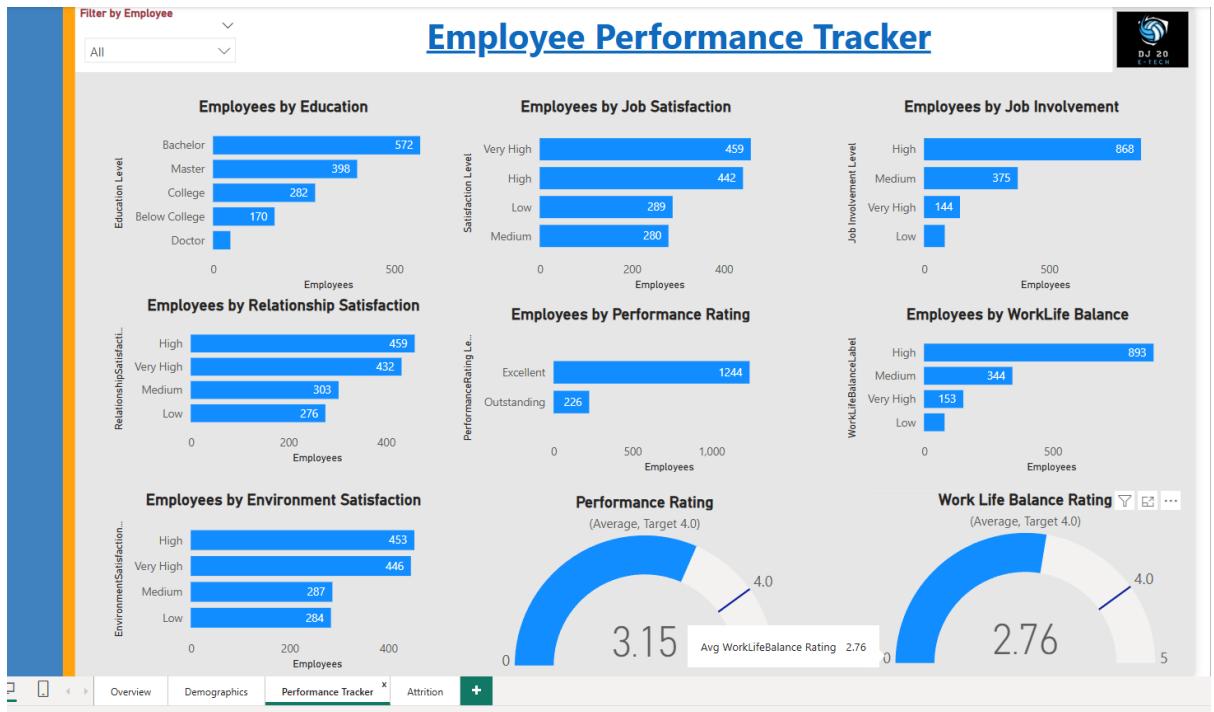
Now I can use Average Performance rating measure to create my gauge for Performance rating. I decided to add a mock-up target of "4.0" to make it more realistic.



Here is the gauge for Work Life Balance rating.



This is the “Performance Tracker” page after some fine-tuning:

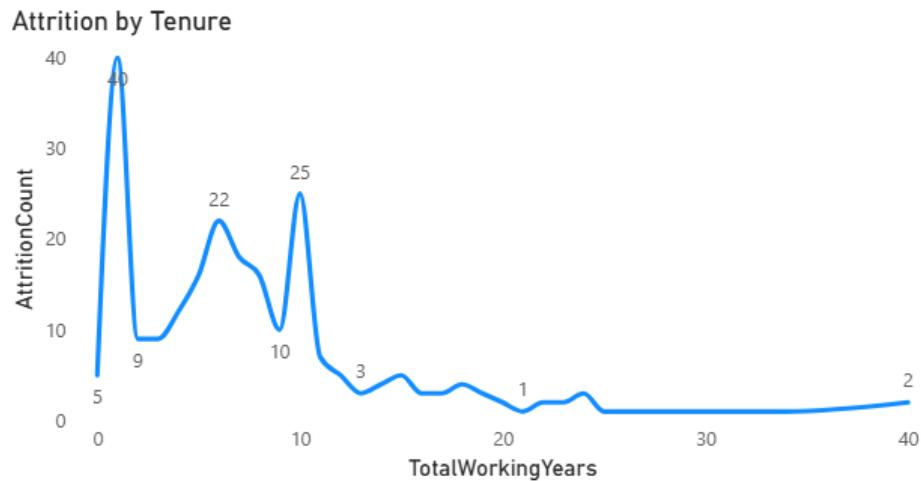


4. Line and Bar Charts for Attrition Page

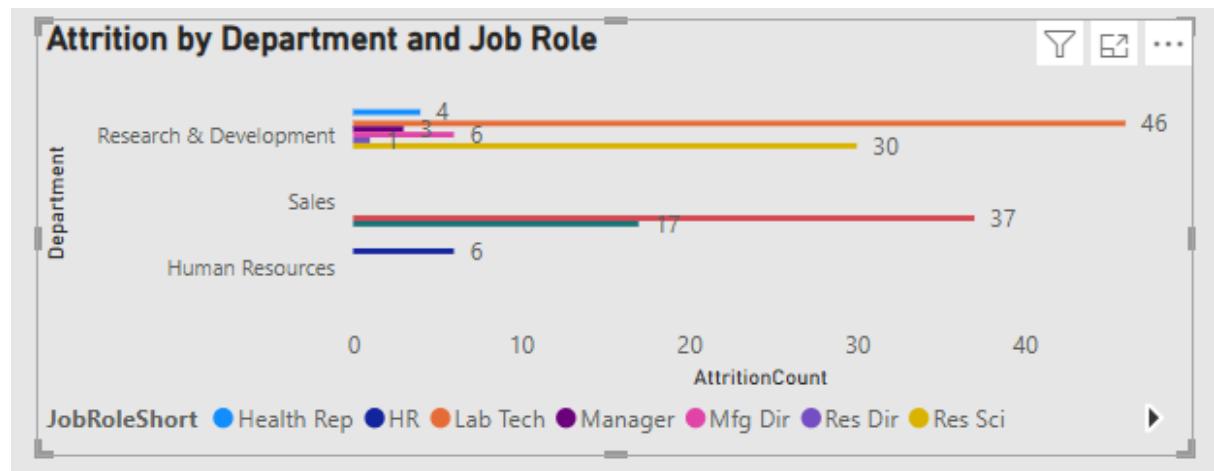
Created a measure for Attrition Count

```
Avg Performance Rating = AVERAGE('Employee Data 2018 - 2019'[Performance Rating ID])
```

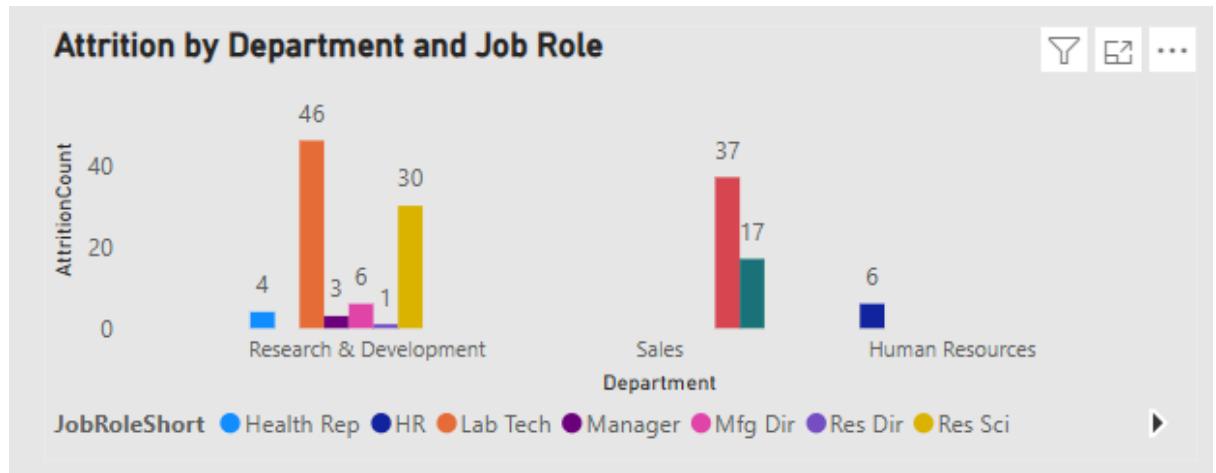
Created line chart to show Attrition by Tenure:



Selected clustered bar charts for "Attrition by Department and Job Role", however, I realized that the bar charts are too thin and hard to view.



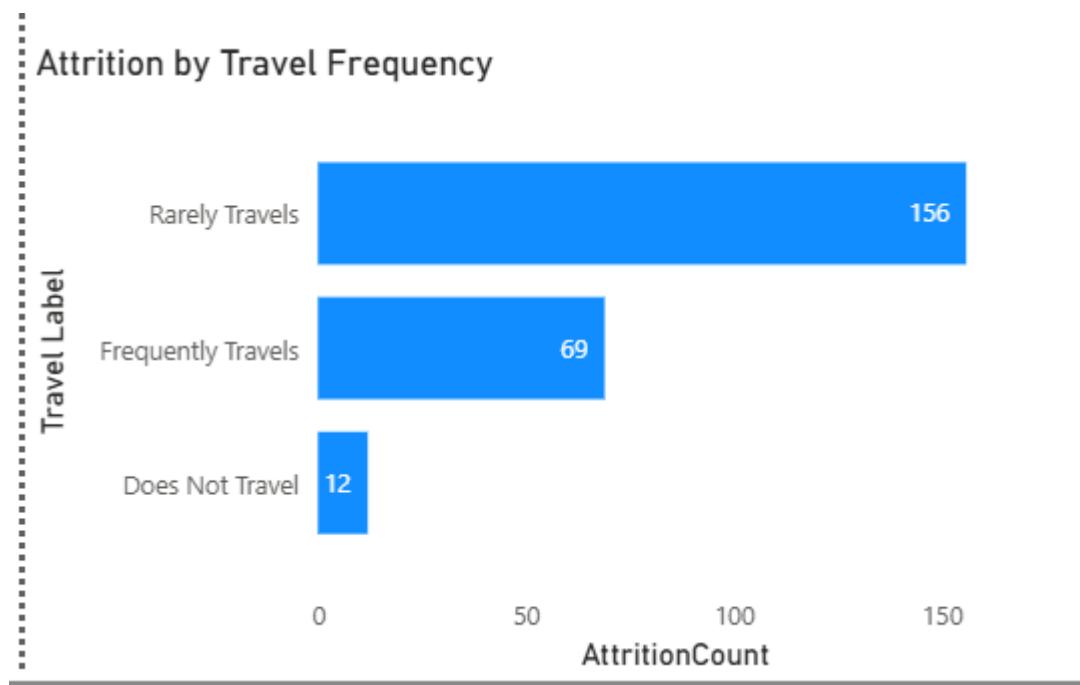
So, I decided to use clustered column charts instead, this is clearer visually.



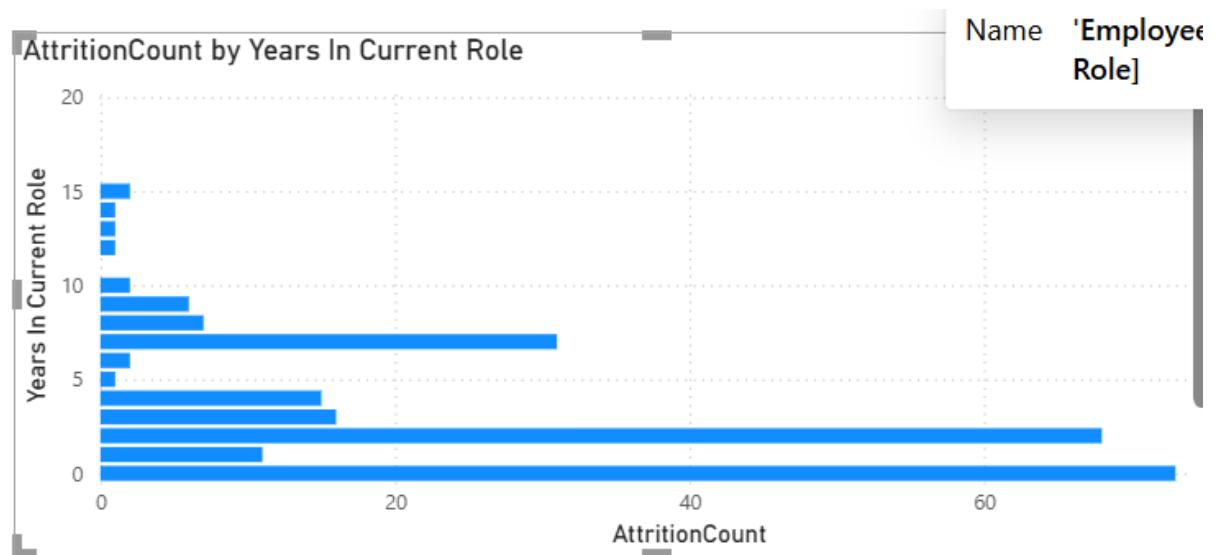
The travel frequency labels of "Travel_Rarely" for example is not easily understood, hence I decided to create a new column, and switch the Business Travel labels to something more intuitive, for example "Rarely Travels".

```
1 Travel_Label =
2 SWITCH(
3     'Employee Data 2018 - 2019'[Business Travel],
4     "Travel_Rarely", "Rarely Travels",
5     "Travel_Frequently", "Frequently Travels",
6     "Non-Travel", "Does Not Travel",
7     "Unknown"
8 )
9
```

Here is the created bar chart to show Attrition by Travel Frequency;



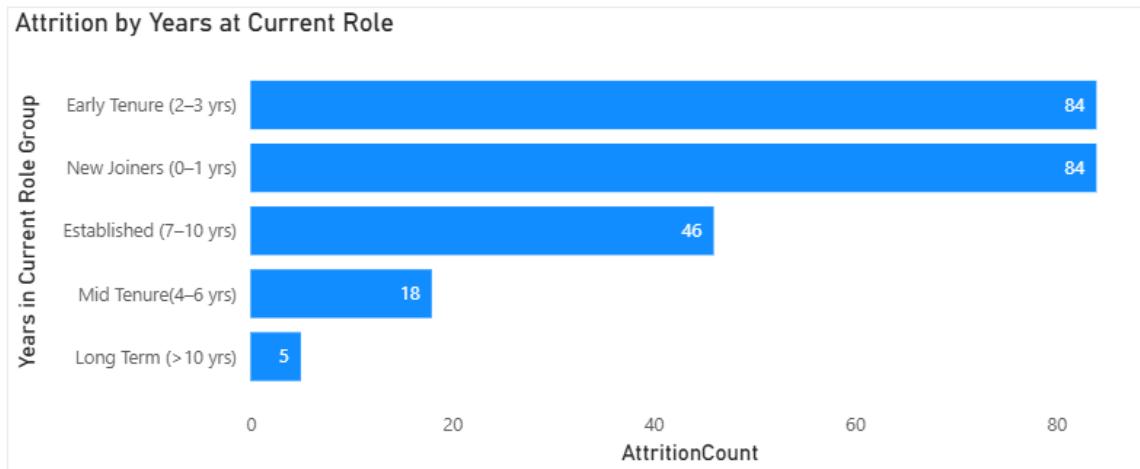
The bar chart for Attrition by Years at Current Role needs to be better presented, hence I created groupings for a more intuitive presentation. This was an earlier version of the chart:



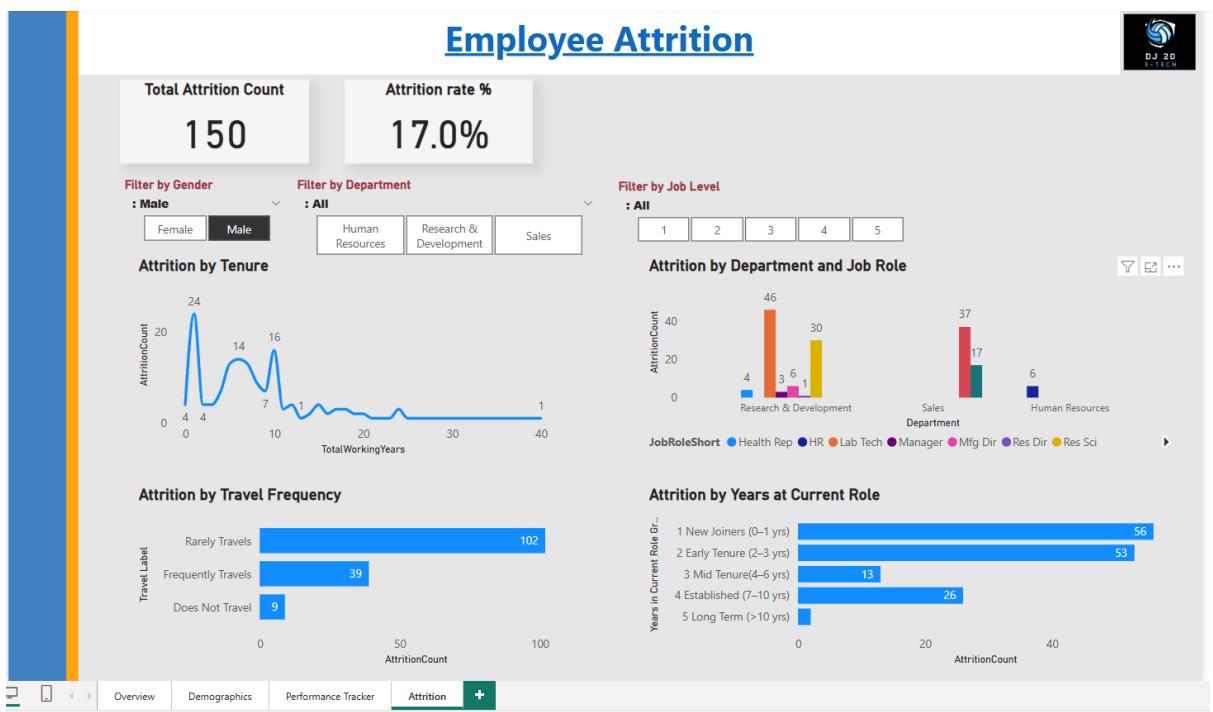
New column 'YearsInCurrentRoleGroup" created:

```
1 YearsInCurrentRoleGroup =
2 SWITCH(TRUE(),
3     'Employee Data 2018 - 2019'[Years In Current Role] <= 1, "New Joiners",
4     'Employee Data 2018 - 2019'[Years In Current Role] <= 3, "Early Tenure",
5     'Employee Data 2018 - 2019'[Years In Current Role] <= 6, "Mid Tenure",
6     'Employee Data 2018 - 2019'[Years In Current Role] <= 10, "Established",
7     "Long Term"
8 )
9
```

Created bar chart for Attrition by Years at Current Role:



This is the Attrition page after some fine-tuning:



Insights from the analysis:

The analysis revealed several key trends related to employee attrition and performance across the organization:

1. One of the most significant findings was that **departments such as Sales and Research & Development experienced higher attrition rates** compared to others.
 - a. By visualizing attrition rates over the years, we observed notable fluctuations, prompting the need to further investigate organizational or external factors influencing these changes.
 - b. Additionally, **employees with shorter tenure—particularly those under two years—were found to be more prone to leaving**, suggesting that early engagement and onboarding processes are critical areas for improvement.
2. Another insightful dimension explored was employee performance.
 - a. Using KPI cards and gauge charts, the average performance rating across the organization was found to be below the benchmark target of 4.0.
 - b. Notably, **employees with higher job satisfaction and work-life balance scores generally achieved better performance ratings**, reinforcing the importance of investing in employee well-being and satisfaction initiatives.
 - c. Conversely, **low levels of job involvement and relationship satisfaction were common among those who eventually left the company**, underlining their predictive value in attrition behavior.
3. The demographic analysis brought to light that **the workforce is largely concentrated in the 25–35 age bracket**, with a near-even gender distribution in some departments.
4. **Attrition by age group suggested that younger employees are more likely to leave**, possibly due to greater mobility or unmet career expectations.
5. Furthermore, **business travel frequency showed a correlation with attrition**, where employees who travel frequently or not at all were more likely to leave, hinting at the need for balance and clarity in travel-related expectations.
6. From a compensation perspective, the average salary varied widely across departments and job roles. A combined chart showing average salary by age bin and job level indicated that **some roles may be undercompensated relative to their peers**, which could contribute to voluntary turnover. These insights suggest the importance of regular compensation benchmarking and aligning reward structures with both market data and employee contributions.

Overall, this analysis equips HR stakeholders with a powerful tool to **proactively identify at-risk employee segments, understand drivers of attrition, and align workforce strategies** with data-driven evidence. The integration of slicers and hierarchies in the dashboards also empowers users to drill down into specific demographics, departments, or time periods, enabling **informed and responsive HR decision-making**.

An executive presentation on key takeaways and next steps:

| Insights | Recommended improvements |
|---|--|
| Sales and Research & Development experienced higher attrition rates | Investigate organizational or external factors influencing high attrition rates in these departments |
| Low levels of job involvement and relationship satisfaction were common among those who eventually left the company | Invest in employee well-being and satisfaction initiatives |
| Average performance rating across the organization was found to be below the benchmark target of 4.0 | Invest in employee well-being and satisfaction initiatives |
| Employees with shorter tenure, particularly those under two years, were found to be more prone to leaving | Early engagement and onboarding processes are critical areas for improvement |
| Attrition by age group suggested that younger employees are more likely to leave | Investigate if it is due to unmet career expectations, and explore job re-design |
| Business travel frequency showed a correlation with attrition | Need for balance and clarity in travel-related expectations. |
| Some roles may be undercompensated relative to their peers | Need for regular compensation benchmarking and aligning reward structures with both market data and employee contributions |

Important Lessons Learned throughout this project:

Through this project, I gained valuable hands-on experience in transforming raw HR data into meaningful, actionable insights using Power BI.

One of the key lessons I learned was the importance of thorough data cleaning and preparation; handling null values, standardizing column names, and removing irrelevant data were foundational to accurate modeling.

I also realized the significance of establishing proper relationships and hierarchies in the data model, which directly impacted the functionality and interactivity of my dashboards. Creating calculated columns and DAX measures taught me how to derive new insights and build KPIs that align with business goals.

Furthermore, designing user-friendly and visually appealing reports helped me appreciate the principles of data storytelling and user-centric design. Lastly, incorporating slicers, bookmarks, and navigation enhanced the dynamic nature of the report, giving end-users the flexibility to explore data across different perspectives. Overall, this project has deepened my understanding of the full data visualization lifecycle and its practical application in solving real-world HR challenges.