HR Data Analysis

Team 3

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Introduction:

This data model was developed in Power BI to support HR and employee performance analysis. It includes employee demographic information, performance ratings, and satisfaction levels. The relationships are structured to support efficient filtering, slicing, and aggregation of performance metrics by employee attributes.

Objectives:

The primary objective of this project is to develop an HR Analytics Dashboard in Power BI, providing data-driven insights to help HR teams make informed decisions regarding employee performance, satisfaction, attrition, and career growth. The dashboard will offer interactive visualizations and real-time analytics.

1. Employee Performance Analysis

- What are the key factors influencing employee performance?
- How do self-ratings compare to manager ratings?
- Which employees have consistently high or low performance ratings?
- What is the relationship between job satisfaction and performance?
- How do training opportunities impact employee performance?

2. Employee Satisfaction & Engagement

1. What are the most common satisfaction levels among employees?
2. Which departments or roles have the highest and lowest satisfaction scores?
3. How does work-life balance affect job satisfaction?
4. What are the main reasons employees report dissatisfaction?
5. How does training influence employee engagement and satisfaction?

3. Salary Analysis

- What is the average, median, and maximum salary in the organization?
- Which department has the highest and lowest average salary?
- What is the impact of education level on average salary?
- Which departments experience the highest salary growth per year?
- What job roles experience the highest salary growth per year?
- What is the difference in average salary between employees who stayed and those who left?
- Is there a salary gap between genders?

4. Education & Career Development Analysis

- How does education level impact employee performance and career progression?
- Which departments have the highest and lowest levels of employee education?
- What is the relationship between education and job satisfaction?

- How do training and upskilling efforts impact employee growth

5. HR KPI Dashboard & Decision Support

- What key HR metrics should be monitored regularly?
- How can we visualize performance, satisfaction, and attrition trends in Power BI?
- What filters and drill-down options should be included for better insights?
- How can HR teams use data to make informed decisions?

6. Workforce Planning & Future Trends

- What are the predicted workforce trends for the coming years?
- Which departments are at risk of staffing shortages?
- How can HR prepare for future hiring and training needs?
- What strategies can help improve employee retention and development?

7. Attrition & Retention Insights

● Who are the employees most likely to leave the company?

● What trends exist in employee attrition over time?

● Why are employees leaving, and what factors contribute to turnover?

● How does job role, promotion history, and manager relationship affect retention?

8. Diversity & Inclusion Insights

● What is the gender distribution across different job roles?

● How does diversity affect employee satisfaction and performance?

● Which ethnic groups are underrepresented in leadership roles?

● How does career progression vary across different demographic groups?

Modeling(schema):

- **Employee**
  Primary Key: EmployeeID
- **PerformanceRating**
  Primary Key: PerformanceID
  Foreign Key: EmployeeID (linked to Employee)
- **EducationLevel**
  Primary Key: EducationLevelID
- **RatingLevel**
  Primary Key: RatingID
- **SatisfiedLevel**
  Primary Key: SatisfactionID

Pages Overview:

1.Employee Performance

This report page provides a comprehensive overview of employee performance indicators across the organization. It combines key HR metrics, satisfaction levels, and ratings to help stakeholders assess workforce engagement and managerial effectiveness.

Key Metrics (KPI Cards at the Top)

Total Employees (1326):

Displays the total number of employees in the organization.

Total Attrition (218):

Shows how many employees have left the company.

Attrition Rate (0.164):

The proportion of employees who have left, calculated as:

Attrition Rate=Total Attrition/Total Employees

Average Age (28.97):

Provides insight into the age distribution of the workforce.

Average Salary (112.87K):

Reflects the mean annual salary across all employees.

Average Years at Company (4.54):

Indicates the average tenure, which helps measure employee retention and loyalty.

Visualizations and Their Purpose

1. Line Chart: Count of EmployeeID by ManagerRating

Visualizes the number of employees associated with each manager rating score (2 to 5). Helps identify how ratings are distributed across the workforce.

2. Pie Chart: Count of JobSatisfaction by ManagerRating
Shows how job satisfaction scores are distributed among different manager rating levels. Assists in correlating managerial effectiveness with employee job satisfaction.
3. Donut Chart: Count of EmployeeID by SelfRating
Displays the count of employees by their self-assessed performance rating. Helps HR compare self-perception versus manager evaluations.

4. Bar Chart: Avg ManagerRating by Department
Shows the average manager rating across different departments (e.g., Sales, HR, Technology). Useful for identifying departmental leadership strengths or weaknesses.
5. Donut Chart: Count of EmployeeID by ManagerRating
Another view showing the distribution of employees by manager rating, likely filtered or styled differently. Useful for a quick glance at rating balance.

2.Satisfaction and Job Engagement

Objective

This report page focuses on analyzing employee satisfaction levels and their relationship with factors such as job satisfaction, work-life balance, department, and training opportunities. It helps HR teams identify areas for improving engagement and retention by understanding what contributes to or detracts from employee satisfaction.

Filters & Controls

SatisfactionLevel Slicer:
Allows users to filter all visuals based on satisfaction levels

Visualizations and Their Purpose

1. Bar Chart: WorkLife Balance Affect Job Satisfaction
X-axis: WorkLifeBalance rating (1 to 5)
Y-axis: Count of Employees.

2.Bar Chart: Satisfaction Level Among Employees
Displays the number of employees within each satisfaction category.
Shows the distribution and highlights that most employees fall into Neutral, Satisfied, or Dissatisfied categories, while very few are Very Dissatisfied.

3. Donut Chart: Count of EmployeeID by JobSatisfaction
Visual breakdown of employees by their job satisfaction level
Each segment represents the proportion of employees in each satisfaction group, providing quick insight into how people feel about their roles.

4. Stacked Bar Chart: Sum of TrainingOpportunitiesTaken by JobSatisfaction
Compares how many training opportunities were taken by employees at different levels of job satisfaction., Suggests that employees with a moderate satisfaction rating tend to participate more in training.

5. Stacked Bar Chart: Count of EmployeeID by SatisfactionLevel and Department
Cross-analyzes satisfaction levels with departments
Useful for identifying departments where satisfaction is lower or higher than average.

6. Line Chart: Sum of TrainingOpportunitiesWithinYear by JobSatisfaction
Line trend showing the total training opportunities throughout the year for each job satisfaction level.
Can be used to determine how training frequency correlates with satisfaction.

3. Education & Career Development Analysis

Objective

This page is designed to explore the relationship between employees' educational background and various career development metrics, such as performance ratings, training participation, average tenure, and overall representation. It helps HR managers identify trends related to workforce education and its impact on productivity and engagement.

Filters & Controls

EducationLevel Slicer

Enables the viewer to filter the data by education level

Visualizations and Their Purpose

1. KPI Cards

AvgTrainingPerEmployee: Shows the average number of training sessions taken per employee (0.95).

AvgManagerRating: Displays the average manager rating across all employees (3.45).

2. Bar Chart: Average Performance Rating by Education Level

X-axis: Average Performance Rating

Y-axis: Education Level

Helps compare performance across educational backgrounds. Surprisingly, individuals with No Formal Qualifications and High School education appear to have similar or even slightly higher performance ratings than advanced degree holders.

3. Bar Chart: Count of Training Opportunities by Education Level

Shows total training opportunities taken by employees in each education category. Bachelor’s and master’s degree holders participate

in the most training programs.

4. Bar Chart: Average Performance by Education Level
Another visualization reinforcing performance comparison.

This duplication helps verify consistency across visualizations.

5. Bar Chart: Employee Count by Education Level
Represents the distribution of the workforce across different education levels. Most employees hold bachelor’s degrees, followed by Master's and High School.

6. Line Chart: Avg Years at Company by Education Level
Indicates how long employees of each education level tend to stay at the company. High School and Doctorate holders have the highest average tenure, while master’s holders tend to have the lowest.

4. Salary Analysis

Objective

The Salary Analysis page provides an in-depth overview of employee compensation trends across various dimensions such as department, education level, job role, gender, and attrition status. This helps stakeholders identify salary disparities, assess growth trends, and guide compensation strategies for fairness and competitiveness.

Key Performance Indicators (KPIs)

Average Salary: $112.87K
Median Salary: $70.75K

Maximum Salary: $547K
These KPIs provide a quick snapshot of the central tendencies in compensation across the organization.

Visualizations and Insights

1. Average Salary by Department
Compares average salary across Sales, Human Resources, and Technology. Sales appear to have the highest average salary among the departments shown.
2. Average Salary by Education Level
Displays a clear upward trend: employees with Doctorate and master's degrees earn more on average. Those with No Formal Qualification earn the least.
3. Salary Growth per Year by Department
Compares salary growth rate across departments.
Sales show the highest annual salary growth, followed closely by HR and Technology.
4. Salary Growth per Year by Job Role
Highlights which job roles experience the most salary growth:
HR Business Partner and HR Manager lead in salary growth.
Recruiters and Sales Reps have the lowest growth.
5. Average Salary by Attrition
Pie Chart differentiates average salaries of employees who have left vs. those who stayed.
Employees who did not leave have a higher average salary ($119.07K).
Employees who left had a lower average salary ($81.38K), indicating a possible link between compensation and attrition.

6. Average Salary by Gender

Compares male and female average salaries:

Females: $113.94K

Males: $111.77K

The difference is marginal but indicates a slightly higher average salary for women in this dataset.

Interpretation & Use

.Education and job roles significantly influence salary and growth.

.Compensation seems to align with advanced qualifications, but retention may also be tied to how competitive the salary is.

.The gender pay gap appears negligible, suggesting equitable pay practices.

.Departments like Sales show both higher salaries and growth, which may indicate market-driven compensation policies

5. HR KPI Dashboard & Decision Support

Objective

The HR KPI Dashboard & Decision Support page provides a high-level overview of key HR metrics such as employee count, attrition rate, training engagement, and performance trends. This dashboard is designed to support strategic decision-making by giving leadership insights into workforce dynamics and organizational performance.

Key Performance Indicators (KPIs)

Total Employees: 1,326

Attrition Rate: 0.16 (or 16%)

Average Performance Rating: 3.96

These KPIs provide an instant snapshot of the company's workforce size, turnover rate, and average employee performance level.

Visualizations and Insights

1. Average of Training Opportunities Taken by Department
Shows department-wise engagement in training programs.
Technology and Sales departments lead in average training participation.
Human Resources shows lower engagement levels, which may be a development opportunity.

2. Average Performance by Job Satisfaction
A scatter plot highlighting how average performance ratings vary by job satisfaction levels.
There is a positive trend: higher job satisfaction correlates with slightly better performance ratings.

3. Employee Count by Department and Attrition
A stacked bar chart showing employee distribution by department and attrition status (Yes/No).
Technology has the highest headcount, but also notable attrition.
Sales has moderate attrition, while HR has very low turnover.

4. Average Performance Rating by Year
A line graph tracking performance rating trends from 2012 to 2022.
Performance ratings are relatively stable over time, with a noticeable

increase in 2022, indicating improved employee outcomes or revised evaluation standards.

6.Workforce Planning

Objective

The Workforce Planning page provides insights into employee tenure, attrition patterns, and workforce distribution over time. The primary goal of this page is to help HR and leadership teams analyze employee retention trends, identify high-risk tenure brackets, and plan future workforce strategies accordingly.

Key Performance Indicators (KPIs)

Total Employees: 1,326
Attrition Rate: 0.16 (16%)
Average Tenure: 94.20 months (~7.85 years)
These KPIs reflect the overall size of the workforce, turnover intensity, and average length of employee service within the organization.

Visualizations and Insights

1. Attrition Rate by Department
Compares the attrition rate across departments:
Human Resources has the highest attrition rate.
Sales also shows elevated attrition.
Technology maintains a comparatively lower attrition rate.
Useful for identifying departments that may need targeted retention strategies.

2. Attrition Rate by Years at Company
A line chart showing how attrition varies with employee tenure.

Attrition is highest within the first year, then gradually declines with increased years of service.
A small spike at year 5 suggests a possible milestone-driven turnover.

3. Employee Count by Years at Company
A distribution of employees based on their tenure.
Highest concentration of employees is in their first 1-2 years, after which the count drops.
Suggests relatively recent hiring surges or challenges in long-term retention.

4. Sum of Tenure (Months) by Gender
A pie chart breaking down total tenure by gender:
Male employees: 51.57% of total tenure.
Female employees: 48.43% of total tenure.
Indicates a fairly balanced distribution of tenure across genders.

7. Age & Gender Analysis

Purpose

The *Age & Gender Analysis* dashboard provides insights into the distribution of employees by gender, age, ethnicity, and their relationships with job roles and performance. It supports diversity analysis and helps in making data-driven HR decisions regarding inclusion, workforce planning, and equal opportunity.

Key Visuals and Their Interpretations

-Count of EmployeeID by Gender (Bar Chart).

-Displays the total number of male vs. female employees.
-A quick way to assess gender distribution in the workforce.
-Female employees: 675 | Male employees: 651
-Total Employees by Job Role and Gender (Clustered Column Chart)
-Shows the number of male and female employees in each job role.
-Useful for evaluating gender balance within specific job titles.
-Highlights roles with skewed gender distribution.
-Ethnicity by Job Role (Matrix Table)
-Breaks down employee counts by ethnicity for specific job roles (example: Analytics Manager, Data Scientist).
-Helps evaluate diversity in roles based on ethnicity.
-Count of EmployeeID by Age and Gender (Line Chart)
-Represents the age distribution of employees, separated by gender.
-Helps analyze the generational composition of the workforce.
-Can highlight age diversity and identify potential retirement risk zones.
-Average Age by Department (Donut/Pie Chart)
-Displays the average employee age within each department (Technology, Sales, Human Resources).
-Assists in understanding department-wise age dynamics which can inform succession planning.
-Average Performance Rating by Gender (Bar Chart)
-Compares average performance ratings between male and female employees.

New Measures:

- Attrition Rate = DIVIDE ([Total Attrition], [Total Employees], 0)
- Average Age = AVERAGE (Employee [Age])
- Average Performance Rating = AVERAGE('PerformanceRating'[SelfRating])
- Average Salary = AVERAGE (Employee [Salary])
- Average Satisfaction = AVERAGE('SatisfiedLevel'[Satisfactionlevel])
- Avg Years at Company = AVERAGE (Employee [YearsAtCompany])
- AvgTrainingPerEmployee = AVERAGE (PerformanceRating [TrainingOpportunitiesTaken])
- AvgYearsAtCompany = AVERAGE (Employee [YearsAtCompany])
- EmployeeCount = COUNT (Employee [EmployeeID])
- High PerformersCount = CALCULATE(COUNTROWS('PerformanceRating'), 'PerformanceRating'[SelfRating]>= 4)
- MaxSalary = MAX (Employee [Salary])
- MedianSalary = MEDIAN (Employee [Salary])
- SalaryGrowthPct =

```
VAR HireDate = MIN (Employee [HireDate])
VAR CurrentSalary = AVERAGE (Employee [Salary])
VAR StartingSalary =
  CALCULATE (
    AVERAGE (Employee [Salary]),
    FILTER (Employee, Employee [HireDate]) )
RETURN
  IF (StartingSalary > 0,
    DIVIDE (CurrentSalary - StartingSalary,
StartingSalary),
    BLANK ()
 )
```

- SalaryGrowthPerYear =DIVIDE (AVERAGE (Employee [Salary]),

AVERAGE (Employee [YearsAtCompany]), 0)

- SalaryGrowthRate =

DIVIDE(AVERAGE(Employee [Salary]), AVERAGE(Employee[YearsAtCompany]), 0)

- Total Attrition = CALCULATE(COUNT(Employee [EmployeeID]), Employee[Attrition] = "Yes")
- ```
  Total Employees = COUNT(Employee [EmployeeID])
  ```
- ```
  Training Hours vs Satisfaction
  =SUMX('PerformanceRating', [TrainingOpportunitiesTaken]
  * RELATED('SatisfiedLevel'[Satisfactionlevel]))
  ```