HR Analytics Dashboard Documentation

Project Overview

This project is an interactive **HR Analytics Dashboard** built using **Power BI** and **Tableau**. It provides insights into employee performance, attrition trends, job satisfaction, and salary distribution using CSV-based datasets. The dashboard includes KPIs such as employee tenure, attrition rates, and performance ratings to help HR teams make data-driven decisions.

1. Project Planning & Management

Objective:

Build an interactive Power BI dashboard to analyze employee performance, satisfaction, and retention trends.

Scope:

- Analyze employee demographics, performance ratings, and attrition.
- Include KPIs like average salary, job satisfaction levels, attrition rates, and tenure trends.

Project Plan:

- **Timeline:** Gantt chart approach with stages like data transformation, modeling, and visualization.
- **Milestones:**

Milestone	Task	Start Date	End Date
Data Preparation	Collect and clean employee datasets	March 1, 2025	March 7, 2025
Dashboard Design	Define KPIs	March 8, 2025	March 14, 2025
Data Modeling	Transform and integrate datasets using Power Query	March 15, 2025	March 21, 2025
Visualization Development	Build Power BI and Tableau dashboards	March 22, 2025	March 28, 2025
Interactivity & Refinement	Implement filters, slicers, and optimizations	March 29, 2025	April 4, 2025
Final Review & Documentation	Test, validate insights, and finalize the report	April 5, 2025	April 10, 2025

- **Resources:** Power BI, SQL for data transformation, CSV files.

Task Assignment:

- **Data Cleaning & Transformation:** Mohammad Walid Hosny Hussein
- **Dashboard Design & KPIs:** Kerolos Hani Nabil Zaki, Yassen Khaled Lotfy Ahmed
- **Report Storytelling & Interactivity:** Yousef Abdalla Agaiby Faleh
- **Tableau Implementation:** Taghrid Yasser Gomaa Eid
- **Documentation & Final Report:** Noreen Mohamed Ashraf Hassen

Risk Assessment & Mitigation:

- **Risk:** Inconsistent employee data → **Solution:** Data validation techniques.
- **Risk:** Dashboard performance issues → **Solution:** Optimize DAX queries and data model.

KPIs:

- Employee attrition rate
- Average salary per job role
- Performance rating distribution
- Job satisfaction levels
- Years at company vs. attrition trends

2. Dataset Overview

CSV Files Used:

- **Employee.csv**: Contains employee details (EmployeeID, Name, Age, Gender, etc.).
- **EducationLevel.csv**: Employee education levels.
- **PerformanceRating.csv**: Performance rating scores.
- **RatingLevel.csv**: Rating categories.
- **SatisfiedLevel.csv**: Employee satisfaction levels.

Primary Dataset Structure (Employee.csv):

Column Name	Description
EmployeeID	Unique identifier for each employee
FirstName	Employee’s first name
LastName	Employee’s last name
Gender	Employee gender
Age	Employee age
BusinessTravel	Travel frequency
Department	Employee's department
DistanceFromHome	Distance from home to work (KM)
State	Location state
Ethnicity	Employee ethnicity
Education	Education level
EducationField	Field of study
JobRole	Job position
MaritalStatus	Marital status
Salary	Employee salary
StockOptionLevel	Stock options granted
OverTime	Whether the employee works overtime
HireDate	Date of hiring
Attrition	Whether the employee has left the company
YearsAtCompany	Total years with the company
YearsInMostRecentRole	Years in current role
YearsSinceLastPromotion	Years since last promotion
YearsWithCurrManager	Years with current manager

3. Data Preparation & Cleaning

Data Preprocessing Steps:

1. **Handling Missing Values:**
    - Identify and fill or remove null values in important columns.
2. **Data Formatting:**
    - Convert HireDate to datetime format.
    - Standardize categorical values (e.g., Yes/No to 1/0).
3. **Merging Datasets:**
    - Use EmployeeID as the primary key to join relevant CSV files.
4. **Creating Calculated Columns:**
    - Employee Tenure = Current Year - Hire Year
    - Attrition Status = Binary classification for attrition analysis.

4. System Analysis & Design

Problem Statement:

HR teams struggle to get real-time insights on employee performance and attrition trends.

Use Case Diagram:

Actors include HR Manager, Data Analyst, and CEO.

Software Architecture:

Power BI with data imported from CSV files.

Database Design & Data Modeling:

- **ER Diagram:** Tables for Employees, Performance Ratings, Satisfaction Levels, and Attrition.
- **Logical & Physical Schema:** Primary keys, foreign keys, indexing for performance.

Data Flow & System Behavior:

- **DFD:** Shows data extraction from CSV, transformation in Power Query, and visualization in Power BI.
- **Activity Diagram:** Steps from loading data to generating insights.

UI/UX Design & Prototyping:

- **Wireframes:** Dashboard layout with KPIs on top, filters on the left, and graphs below.
- **UI/UX Guidelines:** Professional color palette, interactive slicers, and readable fonts.

5. System Deployment & Integration

Technology Stack:

Power BI, CSV files, DAX for calculations.

Deployment Diagram:

Data sources to Power BI, cloud-based sharing (Power BI Service).

Component Diagram:

Shows datasets, data model, visualizations, and reports.

6. Contributors

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