

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, Noreen Mohamed Ashraf Hassen
- **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:** All Members

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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