**A logo for a company

AI-generated content may be incorrect.**

**Human Resources Dataset Analysis**

**-Supervised By: Kareem Bakli**

**-Team Members:**

* **Sarah Mahmoud (Team Leader)**
* **Menna Allah Mohamed**
* **Sama Hossamelden**
* **Heba Emad**
* **Sohila Abdalla**
* **Mohamed Tamer**

**1-Project Overview:**

**Objective:** Develop an interactive Power BI dashboard to provide HR teams with real-time insights into workforce performance, employee retention, and hiring efficiency.

**2-Features:**

**-Recruitment Efficiency Monitoring:**

Track time-to-hire, hiring sources, and recruitment success rates.

Identify the most effective hiring channels and recruitment processes.

**-Retention & Attrition Insights:**

Compare tenure across departments, job roles, and age groups.

Predict potential attrition using historical data trends and AI-based forecasting.

**-Performance & Productivity Analysis:**

Visualize performance ratings distribution across various roles and departments.

Correlate performance ratings with salary, tenure, and satisfaction levels.

**-Job Satisfaction & Engagement Metrics:**

Evaluate satisfaction scores across departments and job roles.

Detect areas of low engagement and potential reasons behind it.

**-Interactive Filtering & Data Exploration:**

Enable users to filter data by various attributes like department, job role, and gender.

Dynamic visuals allowing real-time insights and comparisons.

**3-Project Plan&Management:**

|  |  |
| --- | --- |
| **Phase** | **Tasks** |
| **1. Requirements Gathering & Analysis** | Identify KPIs, gather user stories, define functional & non-functional requirements. |
| **2. System Design & Architecture** | Develop technical architecture, use case diagrams, and database structure. |
| **3. Data Collection & Preparation** | Extract HR data from SQL Server & Excel, clean & preprocess data. |
| **4. Data Modeling & Transformation** | |  | | --- | | Build Power BI data model, optimize relationships, implement DAX measures. |  |  | | --- | |  | |
| **5. Dashboard UI/UX Design & Development** | Create interactive visuals, apply filters, ensure accessibility. |
| **6. Interactivity & Performance Optimization** | Implement real-time insights, optimize performance, and ensure fast loading time. |
| **7. Testing & Validation** | Validate data consistency, check filter interactions, performance testing. |
| **8. Deployment & Stakeholder Training** | Publish to Power BI Service, automate data refresh, train HR users. |

**4- Task Assignment & Roles:**

|  |  |
| --- | --- |
| **Task** | **Member Assigned to** |
| **Data Cleaning & Transformation** | Mohamed Tamer & Menna allah Mohamed |
| **Dashboard Design & KPIs** | Heba Emad & Sama Hossamelden |
| **Report Storytelling & Interactivity** | Sarah Mahmoud & Sohila Abdalla |

**5-Key Performance Indicators (KPIs):**

|  |  |
| --- | --- |
| **Category** | **Key Performance Indicators (KPIs)** |
| **Employee Retention** | Employee Turnover Rate, Average Employee Tenure |
| **Hiring Efficiency** | Time-to-Hire |
| **Workforce Insights** | Absenteeism Rate |
| **Employee Engagement** | Employee Satisfaction Score |

**6-Project Management & Execution:**

**Timeline:** Utilize a Gantt chart outlining major phases: data collection, transformation, modeling, visualization, testing, and deployment.

**7-Milestones:**

|  |  |
| --- | --- |
| **Milestone** | **Description** |
| **Data Preparation** | Extract, clean, and preprocess HR data from sources. |
| **Dashboard Design** | Develop layout, UI/UX, and define visualization structure. |
| **Interactivity Implementation** | Add filters, slicers, and dynamic visual elements. |
| **Final Review & Optimization** | Validate accuracy, optimize performance, and ensure responsiveness. |

**8-Resources Required:**

|  |  |
| --- | --- |
| **Resource Type** | **Tools & Technologies** |
| **Data Processing & Transformation** | SQL, Power Query (within Power BI) |
| **Data Storage & Management** | SQL Server, Excel |
| **Visualization & Reporting** | Power BI |
| **Calculations & Measures** | DAX (in Power BI) |

**9-Dataset Overview:**

**Files Included:**

* Employee.csv – Employee records (ID, Name, Age, Gender, Department, etc.).
* PerformanceRating.csv – Employee performance scores.
* EducationLevel.csv – Academic qualifications.
* RatingLevel.csv – Performance rating classifications.
* SatisifiedLevel.csv – Job satisfaction data.

**-Core Dataset (Employee.csv):**

|  |  |
| --- | --- |
| **Column Name** | **Description** |
| **EmployeeID** | Unique identifier for each employee |
| **FirstName** | Employee's first name |
| **LastName** | Employee's last name |
| **Gender** | Employee's gender |
| **Age** | Employee's age |
| **BusinessTravel** | Frequency of business travel |
| **Department** | Department where the employee works |
| **DistanceFromHome (KM)** | Distance from home to workplace (in KM) |
| **State** | Employee's state of residence |
| **Ethnicity** | Employee's ethnicity |
| **Education** | Employee's education level |
| **EducationField** | Field of study related to education |
| **JobRole** | Employee's job title/role |
| **MaritalStatus** | Marital status of the employee |
| **Salary** | Employee's salary |
| **StockOptionLevel** | Stock option level assigned to the employee |
| **OverTime** | Indicates if the employee works overtime (Yes/No) |
| **HireDate** | Date when the employee was hired |
| **Attrition** | Indicates if the employee has left the company (Yes/No) |
| **YearsAtCompany** | Total years worked at the company |
| **YearsInMostRecentRole** | Years spent in the current role |
| **YearsSinceLastPromotion** | Years since the last promotion |
| **YearsWithCurrManager** | Years working with the current manager |

**10-Requirements Gathering & Analysis:**

**Stakeholders:** HR Managers, Recruiters, Executives, and Employees.

**User Stories:**

* *"As an HR Manager, I want to track employee turnover trends to improve retention strategies."*
* *"As a Recruiter, I need real-time insights into hiring metrics to optimize recruitment pipelines."*

**Functional Requirements:**

* Comprehensive employee performance analysis.
* Real-time tracking of hiring trends and workforce demographics.
* Detailed absenteeism and turnover insights.

**Non-Functional Requirements:**

* The dashboard must load in under 5 seconds.
* The UI should prioritize clarity, accessibility, and intuitive navigation.

**11-System Design & Architecture:**

**-Problem Statement:** HR departments face challenges in accessing real-time, actionable insights on workforce dynamics and performance.

**-Use Case Diagram:** Depicts interactions between HR managers, recruiters, executives, and the dashboard.

**-Technical Architecture:** Power BI serves as the visualization tool, with data sourced from SQL Server and Excel.

**-Database Structure:**

* **Tables:** Employees, Departments, Recruitment, and Attendance.
* **Optimization:** Implementation of indexing, foreign keys, and primary keys to enhance query performance.

**-Data Flow & Processing:**

* Data extraction from HR databases and transformation in Power Query.
* Power BI processes and visualizes insights for real-time decision-making.

**-UI/UX Design & Deployment Strategy:**

**-Dashboard Layout:**

* KPIs prominently displayed at the top.
* Filters for dynamic data exploration on the left.
* Interactive visualizations in the central workspace.

**-Design Guidelines:**

* Professional color palette aligned with company branding.
* Interactive slicers for customized analysis.
* Readable typography ensuring accessibility.

**-Deployment Plan:**

* **Technology Stack:** Power BI, SQL Server, Excel for initial data sources, and DAX for advanced calculations.
* **Deployment Diagram:** Outlines integration between Power BI Service and cloud-based data sources.
* **Component Structure:** Defines dataset management, data model organization, and visualization layers.

**12-Additional Deliverables & Quality Assurance:**

**-API Documentation:** If external HR systems are integrated, endpoints and data formats will be documented.

**-Testing & Validation:**

* Ensuring data consistency and accuracy.
* Verifying filter interactions and responsiveness.
* Conducting performance testing to maintain efficiency.

**13-Final Deployment:**

* Publish the dashboard to Power BI Service.
* Configure automated data refresh schedules.
* Provide stakeholder training for optimal usage.

This HR Performance Dashboard will empower HR teams with actionable insights, enabling them to make informed decisions, improve employee experience, and optimize workforce planning.