HR Dashboard Project Report

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Abstract

Business Intelligence (BI) transforms raw data into meaningful insights for business purposes, often through digital dashboards. This project focuses on developing an HR dashboard in Power BI to enhance employee recruitment, satisfaction, and retention. The dashboard comprises three purpose-specific pages enabling human resource teams to track, analyze, and report on HR KPIs effectively.

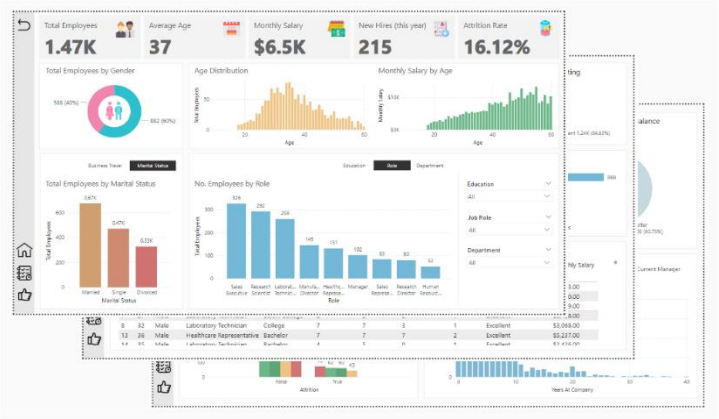

Figure 1 - The dashboard

Working Method

1. **Business understanding**
   IBM, a global technology leader, operates in over 170 countries with a workforce of over 282,000 employees. An HR dashboard could improve recruitment, satisfaction, and retention of the company.

2. **Data collection**
   This step involves establishing the connection to the raw dataset. The project is based on a dataset from Kaggle [1] that presents an employee survey from IBM indicating data.

3. **Data understanding**
   This dataset includes various data points of IBM employees, such as employee demographics, attrition rates, satisfaction, and performance metrics.

4. **Data preparation**

   4.1. Shaping data
   To prepare the dataset for the dashboard, duplicates and irrelevant values were removed, column headers were clarified for usability, data types were appropriated, and the employees' table focused on numeric and binary values, while related tables used verbal values.[2].

   4.2. Building relational data model
   section covers table relationships using data modeling concepts like normalization, primary and foreign keys, and relationship cardinality. The project uses a star schema with the employees' table as the central fact table.

   4.3. Pearson's correlation
   Using a Pearson's correlation matrix helps understand data relationships [3]. Key findings show a strong correlation (0.95) between monthly salary and job level, and notable correlations of 0.78 between job level and total working years, and 0.77 between total working years and monthly salary.

   4.4. Dashboard sketch
   At this step, preliminary graph sketches were planned for a 3-page dashboard, each serving different purposes for HR teams to track and analyze employee conditions.

4.5. Calculating Measures with DAX

DAX calculates columns and measures for the model, creating explicit measures usable throughout the report. Key measures like total employees and average monthly salary offer insights into human capital and cost.

5. Visualizing data with Power BI dashboards

Visualizing data is crucial for understanding results effectively. This project features a three-page Power BI dashboard ("Home", "Employee Performance", "Satisfaction") for clear reporting. It also uses bookmarks to clear filters and slicers, and parameters to dynamically adjust data with slicers.

6. Evaluation and improvement

This phase aimed to evaluate the dashboard and review the construction phases to ensure they adequately achieved the objectives and addressed all critical issues identified in the initial design. After reviewing the dashboard, necessary improvements were made, followed by re-evaluation.

Deployment and Decision Making

Graphical tools are crucial for understanding employee conditions, identifying trends, and deriving actionable insights from the dashboard. This facilitates decision-making to optimize workforce performance and achieve organizational goals.

Page 1 – Home page:
The home page provides an overview of employee demographics through cards and graphs, enhancing HR teams' ability to analyze age, gender, department, and other demographic data crucial to maintaining a diverse and balanced workforce.

Page 2 – Employee Performance page:
This page provides insights into employee performance, enabling informed decisions on performance management, training, and development to unlock your team's full potential.

Page 3 – Satisfaction page:
This page provides insights into employee satisfaction, crucial for a happier, more productive workforce and long-term success through proactive issue addressing and environment cultivation.

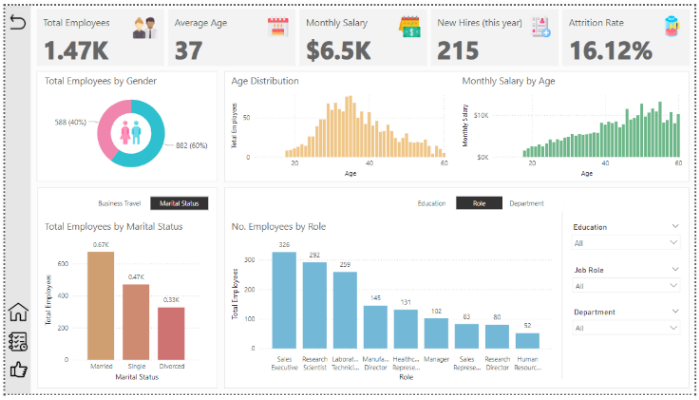

Figure 2 - Home page

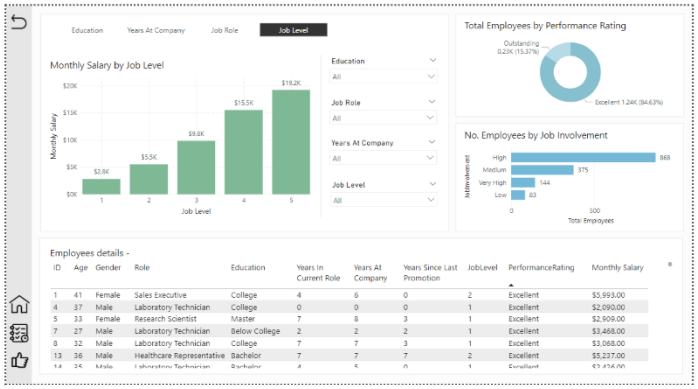

Figure 3 - Employee Performance page

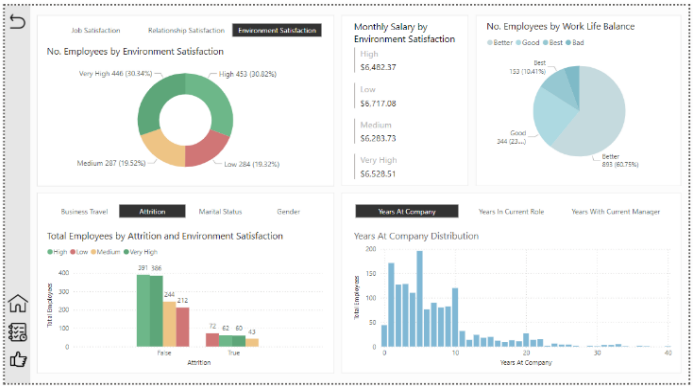

Figure 4 - Satisfaction page

Appendix

[1] "IBM HR Analytics Employee Attrition & Performance" dataset source: https://www.kaggle.com/pavansubhasht/ibm-hr-analytics-attrition-dataset

[2] Employees table after preprocessing- Explanation of each column:

Name column	Values and explanation
ID_Employee	Unique number of each employee.
Age	The age of the employee when the data was taken. (range from 18 to 60)
Attrition	Employee leaving the company. (0=False, 1=True)
ID_BusinessTravel	Business travel. (0=Rarely, 1=Frequency, 2=No)
ID_Department	Department. (1=HR, 2=R&D, 3=Sales)
DistanceFromHome	Distance from work to home.
ID_Education	Education. (1=Below College, 2=College, 3=Bachelor, 4=Master, 5=Doctor)
ID_EducationField	Education field. (0=Human Resources, 1=Life Sciences, 2=Marketing, 3=Medical, 4=Technical Degree, 5=Other)
ID_EnvironmentSatisfaction	Satisfaction of employee with the environment. (1=Low, 2=Medium, 3=High, 4=Very High)
ID_Gender	Gender. (0=Female, 1=Male)
ID_JobInvolvement	The degree to which an employee identifies with his work, actively participates, and derives a sense of self-worth from it. (1=Low, 2=Medium, 3=High, 4=Very High)
JobLevel	Job levels are tiers in an organization's hierarchy that classify employees' relative rank, responsibilities, and authority. (range from 1 to 5)
ID_JobRole	Job role. (0 = Sales Executive, 1= Research Scientist, 2 = Laboratory Technician, 3 = Manufacturing Director, 4 = Healthcare Representative, 5 = Manager, 6 = Sales Representative, 7 = Research Director, 8 = Human Resources)
ID_JobSatisfaction	Satisfaction of employee with the job. (1=Low, 2=Medium, 3=High, 4=Very High)
ID_MaritalStatus	Marital Status. (0 = Divorced, 1 = Married, 2 = Single)
MonthlyIncome	Monthly salary.
NumCompaniesWorked	Number of companies worked at.
ID_PerformanceRating	Work measurement that observes the employee's performance and records a value that represents this performance in relation to the standard performance concept. (1= Low, 2 = Good, 3 = Excellent, 4 = Outstanding)
ID_RelationshipSatisfaction	Satisfaction with the relationship in the company. (1=Low, 2=Medium, 3=High, 4=Very High)
StockOptionLevel	Stock options. (range from 0 to 3)
TotalWorkingYears	Total years of working.
ID_WorkLifeBalance	Time spent between work and outside. (1=Bad, 2=Good, 3=Better, 4=Best)
YearsAtCompany	Years at the company.
YearsInCurrentRole	Years in current role.
YearsSinceLastPromotion	Years since last promotion.
YearsWithCurrManager	Years with current manager.

[3] The Pearson's correlation matrix