Comprehensive Report on Human Resource Data Analytics Dashboard

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1. Introduction

Human Resource (HR) analytics integrates data science and business intelligence to optimize workforce management. It involves the collection, cleansing, and analysis of HR datasets to derive actionable insights that can improve employee engagement, reduce attrition, and enhance organizational efficiency. This project leverages **Power BI**, an advanced data visualization tool, to design an interactive dashboard that addresses key HR metrics.
This report presents the technical methodology, detailed insights derived, and recommendations for actionable outcomes.

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2. Objectives

The primary goal of this project was to use HR data analytics to uncover patterns and correlations influencing employee attrition and satisfaction. Specific objectives include:

- **Attrition Analysis:** Identify trends and drivers behind employee turnover.
- **Demographic Insights:** Analyse workforce composition by age, gender, and education.
- **Satisfaction Metrics:** Quantify and visualize job satisfaction by role and department.
- **Dashboard Development:** Build a dynamic Power BI dashboard for real-time data visualization and decision-making.

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3. Tools and Technologies Used

1. **Power BI:**
    - **Data Loading:** Imported HR datasets in .csv and .xlsx formats into Power BI for analysis.
    - **Data Modelling:** Created relationships between data tables to enable relational queries.
    - **DAX (Data Analysis Expressions):** Utilized advanced DAX formulas for calculated columns and measures, such as attrition rates, average age, and satisfaction scores.
    - **Visualizations:** Designed pie charts, bar graphs, heatmaps, and donut charts for intuitive data representation.
2. **Data Sources:**
    - Employee demographic data: Age, gender, and education.
    - Performance and job satisfaction data.
    - Attrition status and departmental information.
3. **GitHub:**
    - Hosted code files, documentation, and project snapshots.
    - Version control and collaboration to maintain data integrity.
4. **Data Transformation Tools:**

- **Power Query Editor:** Cleaned and normalized data by handling null values, standardizing field formats, and deriving calculated fields.

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4. Dashboard Insights and Visualizations
Key Metrics Visualized:

1. **Employee Attrition Overview:**
   - **Total Employees:** 882
   - **Active Employees:** 732
   - **Attrition Count:** 150
   - **Attrition Rate:** 17.01% (calculated using DAX as: Attrition Rate = SUM(Attrition Count) / SUM(Total Employees)).
2. **Department-Wise Attrition:**
   - Sales accounts for **60%** of attrition, followed by R&D (**36%**) and HR (**4%**).
   - **Visual:** Pie chart illustrating the proportional attrition by department.
3. **Demographics Analysis:**
   - Majority of employees fall in the **25–34 age group**.
   - **Average Age:** 37 years (computed using DAX as: Average Age = AVERAGE(Employee Age)).
4. **Gender Distribution in Attrition:**
   - Attrition among females is higher (**87 females**) compared to males (**63 males**).
   - **Visual:** Donut charts to segment attrition by gender and age groups.
5. **Education Field Analysis:**
   - Employees with **Life Sciences** and **Medical** educational backgrounds report the highest attrition.
6. **Job Satisfaction Ratings:**
   - Employees in roles like **Research Scientist** and **Laboratory Technician** have higher satisfaction levels.
   - **Visual:** Heatmap displaying satisfaction ratings (1–4 scale) across various job roles.

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5. Technical Methodology
Data Preparation:

1. **Data Cleaning in Power Query Editor:**
   - Handled missing data using replacement strategies.
   - Transformed textual data into categorical formats for easier aggregation (e.g., Gender: Male/Female).
   - Standardized date and numeric fields for compatibility.
2. **Data Modelling:**
   - Built relationships between datasets using common keys such as Employee ID and Department.
   - Applied **Star Schema** methodology to optimize query performance.

Dashboard Design Workflow:

1. **Interactive Filters:**
   - Implemented slicers for filtering data by gender, age group, department, and education field.
   - Enabled real-time interaction with visual elements.

2. **Custom Calculated Fields:**
    - Attrition Rate: SUM(Attrition) / SUM(Total Employees)
    - Satisfaction Index: AVERAGE(Satisfaction Score)
3. **Visualization Customization:**
    - Used pie charts for proportional representation of departmental attrition.
    - Donut charts for gender and age-specific attrition segmentation.
    - Heatmaps to visually compare satisfaction levels across job roles.

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6. Findings and Insights

Attrition Trends:

- Sales department has the highest attrition rate (**60%**), indicating potential challenges in job satisfaction or work environment.
- Female employees show higher attrition rates, which might signal gender-specific challenges.

Demographics Impact:

- Younger employees (25–34 years) contribute significantly to attrition, possibly due to career exploration or lack of growth opportunities.
- The average age of employees is 37 years, reflecting a mid-career workforce composition.

Satisfaction Metrics:

- Job roles such as **Research Scientist** and **Laboratory Technician** exhibit higher satisfaction, whereas roles in **HR** and **Sales** show dissatisfaction.

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7. Recommendations

1. **Improve Retention Strategies:**
    - Provide targeted incentives and career growth opportunities for employees in Sales and R&D.
    - Offer flexible work policies and mentorship programs for female employees.
2. **Focus on Job Satisfaction:**
    - Conduct periodic surveys to understand dissatisfaction drivers in HR and Sales roles.
    - Introduce employee recognition programs to improve morale.
3. **Address Education-Specific Attrition:**
    - Offer tailored training and development programs for employees from Life Sciences and Medical backgrounds.
4. **Strengthen Gender Equity:**
    - Implement policies to ensure gender equity in promotions and rewards.

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8. Conclusion

The HR Analytics Dashboard effectively visualizes critical employee metrics, offering valuable insights into workforce demographics, attrition patterns, and job satisfaction. This project demonstrates the potential of data analytics in guiding HR policies and improving organizational efficiency.

The deliverables include an interactive dashboard and a GitHub repository documenting the workflows, ensuring scalability and reproducibility for future analysis.

Attachments

- **Power BI Dashboard File:**

- **GitHub Repository:** https://github.com/Swapnil9887/HR-Analytics-Dashboard