**HR Analytics - Predict Employee Attrition**

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**Introduction**

resignations. Employee attrition is a critical challenge for many organizations, leading to increased costs in recruitment, training, and lost productivity. Understanding the main drivers behind employee resignations can help HR departments develop effective retention strategies. This project aims to identify the primary causes of employee attrition and predict future resignations using analytics.

**Abstract**

This project focuses on analyzing employee attrition data to identify key factors influencing Using tools such as Python for Exploratory Data Analysis (EDA) and Power BI for visualization, insights are drawn on department-wise attrition, salary bands, and age groups most affected. A predictive model is also built to estimate future attrition risks. The **project concludes with** actionable suggestions to mitigate turnover rates.

**Tools Used**

* Python (Pandas, Seaborn, Scikit-Learn) for data processing and model building.
* Power BI for interactive and dynamic data visualization.

**Steps Involved in Building the Project**

1. **Data Collection and Preprocessing:**
   * Imported HR data from CSV and handled missing values.
   * Performed data cleaning and transformation for smooth analysis.
2. **Exploratory Data Analysis (EDA):**
   * Analyzed attrition across departments, salary bands, education, and age groups.
   * Visualized patterns using bar charts, histograms, and pie charts to identify trends.
3. **Model Building:**
   * Built a classification model (Logistic Regression) to predict employee attrition.
   * Evaluated the model with metrics such as accuracy, precision, recall, and confusion matrix.
4. **Dashboard Visualization:**
   * Created an interactive Power BI dashboard showcasing attrition trends by age, department, salary, and designation.
5. **Insights and Prevention Suggestions:**

**Insights:**

* + High attrition is observed among Sales Executives and Laboratory Technicians, with 57 and 62 cases respectively.
  + Employees aged 26–35 remain the most vulnerable to attrition (116 cases), followed by ages 18–25 and 36–45.
  + Life Sciences and Medical backgrounds show higher attrition rates, 38% and 27% respectively.
  + Majority of attrition occurs in the lower salary band (Up to 5k), with 163 employees leaving.

**Prevention Suggestions:**

* + Increase competitive salary offerings for high-risk roles such as Sales Executive and Laboratory Technician.
  + Enhance career development for Life Sciences and Medical graduates to reduce turnover.
  + Implement targeted engagement programs for employees aged 26–35.
  + Address salary band imbalances to improve retention.

**Conclusion**

**The analysis successfully identified key attrition factors, with salary, age group, and job role being significant contributors. The predictive model and Power BI dashboard provide actionable insights for HR to strategize more effectively, potentially reducing employee turnover and improving retention rates.**