

HR Analytics – Predict Employee Attrition

Abstract

Employee attrition is one of the major challenges faced by organizations today. Understanding why employees leave and predicting potential churn can help HR teams make informed decisions, reduce costs, and improve workforce retention.

This project focuses on analysing HR data using data analytics and visualization techniques to identify attrition patterns, develop key performance indicators (KPIs), and build an interactive Power BI dashboard for HR managers. The project also lays the foundation for predictive modelling to forecast employee attrition.

Introduction

Employees are the backbone of any organization. But when attrition rates rise, it affects productivity, costs, and even morale. This project dives into HR data to explore why people leave and what patterns exist. Using Power BI and data analysis techniques, we turned raw data into an interactive dashboard that tells a story. HR professionals can now explore data by age, salary, department, and other categories to find where attrition is happening most.

Tools Used

- Python (data cleaning and analysis)
- Power BI (dashboard and KPIs)
- CSV (dataset format)
- DAX (formulas for KPIs and calculated fields)

Steps Involved in Building the Project

- **Data Preprocessing**
 - Cleaned and transformed the HR dataset
 - Handled missing values, duplicates, and outliers
 - Created new fields such as Age Group and Salary Band for better categorization
- **Exploratory Data Analysis (EDA)**
 - Used Python to analyse data distributions and relationships
 - Identified attrition trends based on department, salary, age, and gender
- **Dashboard Development in Power BI**
 - Defined KPIs: Attrition Rate, Total Employees, Average Salary, Average Age
 - Built slicers for Department, Job Role, Gender, Age Group, Salary Band
 - Designed an interactive and visually appealing dashboard using DAX formulas and custom formatting
- **Insights Generation**
 - Found that younger employees (20–35 age group) and those with lower salaries had higher attrition rates
 - Certain departments like R&D and Sales exhibited higher churn compared to others
- **Future Scope**
 - Incorporating predictive modelling (Logistic Regression, Random Forest, etc.) to forecast attrition probability
 - Automating dashboard updates using Power BI Service

Conclusion

This HR Analytics project shows how data can tell a powerful story. By transforming raw HR data into clear insights, we built a dashboard that helps HR teams take proactive action. The findings highlight which groups are most at risk, and the dashboard makes it easy to explore these insights interactively. Looking ahead, combining this with predictive analytics will make it even stronger, giving companies a way to act before attrition happens.