**HR Analytics & Attrition Risk Project Report**

**🔍 Summary**

This HR analytics project investigates attrition patterns across departments, job levels, age groups, and roles in a corporate organization. The dataset, titled **"HR database1"**, includes employee demographics, job-related variables, and attrition status. Using **Power BI** and **DAX**, we created a dashboard that provides actionable insights to support HR decision-making and reduce employee churn.

**📊 Project Objectives**

* Identify high-risk segments in terms of employee attrition
* Understand which roles, job levels, and education backgrounds are most vulnerable
* Quantify the financial impact of attrition using monthly income data
* Determine whether factors like distance from home, marital status, and overtime have significant correlation with attrition

**📅 Dataset Overview**

* **Source**: Internal HR system (simulated as HR database1)
* **Total Records**: 1,470 employees
* **Attributes**:
  + **Demographics**: Age, Gender, EducationField, MaritalStatus
  + **Employment Details**: Department, JobRole, JobLevel, MonthlyIncome, YearsAtCompany
  + **Work Conditions**: OverTime, DistanceFromHome
  + **Target Variable**: Attrition (Yes/No)

**🔧 Tools Used**

* **Power BI Desktop**: Interactive dashboard creation
* **DAX (Data Analysis Expressions)**: For KPIs and calculated measures
* **Excel**: Initial data inspection and cleanup
* **GitHub**: Portfolio hosting and version tracking

**📈 Key Insights**

**⚡ High Attrition Segments**

* The **Sales Department** has the **highest attrition rate** (20.63%)
* Attrition is most common in **Job Level 1**, especially for **Sales Representatives**
* Employees aged **20–30** are significantly more prone to attrition
* **EducationField: Sales & Marketing** shows a higher proportion of churn

**💸 Financial Impact**

* Employees who left had significantly **lower average monthly income**, especially in lower job levels
* **Sum of Monthly Income (Attrition)**: ₹1.13M vs **Total Monthly Income**: ₹10M
* This indicates a financial loss that is non-trivial and should be addressed

**❌ Non-Significant Indicators**

* **OverTime**, **DistanceFromHome**, and **Marital Status** showed no strong patterns with attrition

**📊 Visualizations in Dashboard**

1. Attrition Rate (%) by Age
2. Attrition Count and Rate by Department
3. Sum of Monthly Income by Job Role
4. Attrition Rate by EducationField and Job Level
5. KPI cards: Monthly Income (Attrition), Total Monthly Income
6. Line charts for trends in Age vs Attrition vs Income

**🧰 DAX Measures Used**

-- Attrition Count

Attrition Count = CALCULATE(COUNTROWS(EmployeeData), EmployeeData[Attrition] = "Yes")

-- Attrition Rate (%)

Attrition Rate (%) =

DIVIDE( CALCULATE(COUNTROWS(EmployeeData), EmployeeData[Attrition] = "Yes"),

COUNTROWS(EmployeeData))

-- Sum of Monthly Income (Attrition)

Sum of MonthlyIncome (Attrition) =

CALCULATE(SUM(EmployeeData[MonthlyIncome]), EmployeeData[Attrition] = "Yes")

-- Total Monthly Income

Total MonthlyIncome = SUM(EmployeeData[MonthlyIncome])

-- Average Distance From Home

Average DistanceFromHome = AVERAGE(EmployeeData[DistanceFromHome])

-- Attrition Rate by Department

Attrition Rate by Department =

DIVIDE(

CALCULATE(COUNT(EmployeeData[EmployeeNumber]), EmployeeData[Attrition] = "Yes"),

CALCULATE(COUNT(EmployeeData[EmployeeNumber]))

)

**🔍 Detailed Early-Career Churn Risk**

Employees who are:

* Aged between **20–30**
* In **Job Level 1**
* Working in the **Sales Department**
* Holding roles like **Sales Representative**
* From **Sales/Marketing** education backgrounds

...are the most at-risk and should be prioritized for retention planning.

**📚 Recommendations**

1. **Offer better compensation** or performance-based incentives for Sales Representatives
2. **Implement mentorship programs** for new, young joiners to improve retention
3. Consider **education field alignment** while hiring for roles with historically high attrition
4. **Monitor early tenure employees** more closely
5. **Develop personalized engagement strategies** based on age, job level, and job role

📄 Conclusion

This Power BI-driven project provided valuable insights into employee attrition patterns using real HR data. By leveraging DAX and interactive visuals, we identified early-career risk zones and actionable trends. This kind of analysis can empower HR teams to retain top talent, save recruitment costs, and enhance employee experience.