SCTR's Pune Institute of Computer Technology, Pune

A PROJECT REPORT ON

Employee Attrition Analysis Using Business Intelligence Tools

SUBMITTED BY

Class: BE 4 (R4)

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Title:

Employee Attrition on Analysis Using Business Intelligence Tools.

Problem Statement:

Employee attrition (voluntary or involuntary exits) leads to a loss of valuable skills, disrupts organizational operations, and increases recruitment and training costs. The objective is to analyse employee data to uncover pa erns that contribute to attrition and generate actionable insights to reduce turnover.

Learning Objectives:

- Understand the causes and pa erns behind employee attrition.
- Apply data mining techniques to real-world HR datasets.
- Create interactive dashboards to visualize attrition trends.
- Recommend data-driven strategies for employee retention.
- Enhance skills in data visualization on and BI reporting.

Learning Outcomes:

- Ability to define business problems and translate them into data mining tasks.
- Proficiency in analysing large HR datasets.
- Skill in designing insightful dashboards using BI tools like Power BI/Tableau.
- Ability to derive strategic recommendations to address HR challenges.
- Improved storytelling through visual data interpretation.

Theory:

Employee Attrition refers to the gradual reduction of a workforce by employees leaving and not being immediately replaced. Key theories involved:
- Human Capital Theory: attrition leads to a loss of accumulated human capital.
- Maslow's Hierarchy of Needs: Unmet employee needs lead to turnover.
- Data Mining Theory: Using classification, clustering, and association mining to predict and understand attrition.

- HR Analy cs Framework: Predictive modelling, descriptive analytics, and prescriptive analytics form the basis for tackling employee turnover.

Methodology:

1. Problem Definition
- Identify factors influencing Attrition such as salary, job role, years at company, age, and education background.

2. Data Mining Task
- Classification: To predict if an employee is likely to leave.
- Clustering: To group similar profiles of employees at risk.
- Association Analysis: To find common pa erns among employees who left.

3. Dataset Used
- The uploaded file HR_Analytics.csv, mimicking famous datasets like IBM HR Analy cs Employee Attrition dataset.

4. Steps Taken
- Data Preprocessing: Cleaning missing values, transforming categorical data into numerical.
- Exploratory Data Analysis: Identifying distributions and outliers.
- Dashboard Crea on: Using BI tools for visuals like:
  - Attrition by Education, Salary Slab, Age, Gender, Job Role-wise Attrition
  - Years at Company vs Attrition

5. Key Visualizations
- Attrition by Age Group, Gender, and Salary Brackets.
- Job Role vs attrition Analysis.
- Trends in Attrition over Years of Service.

Result:

Conclusion:

The BI report successfully highlights that:
• Younger employees (26–35) and those earning less are more likely to leave.
• Job roles like Laboratory Technician and Sales Executive have higher Attrition.
• Lower salary brackets and lesser years at the company are critical Attrition factors.

By addressing salary disparities, providing career growth opportunities, and focusing on young employees' engagement, organizations can significantly reduce Attrition rates.

Future Scope:

• Develop a Predictive Attrition Model using Machine Learning (Logis c Regression, Random Forest).
• Real- me Attrition Monitoring by integra ng live HRMS data with BI dashboards.
• Sentiment Analysis on employee feedback surveys to predict dissatisfaction early.
• Implement Prescriptive Analy cs to recommend personalized interventions for at-risk employees.