

CAPSTONE PROJECT

HR Analytics & Attrition Analysis

PRESENTED BY

STUDENT NAME: Harshada Lakhe

COLLEGE NAME: Suryodaya College Of
Engineering & Technology

DEPARTMENT: Computer Engineering

EMAIL ID: harshadalakhe4@gmail.com



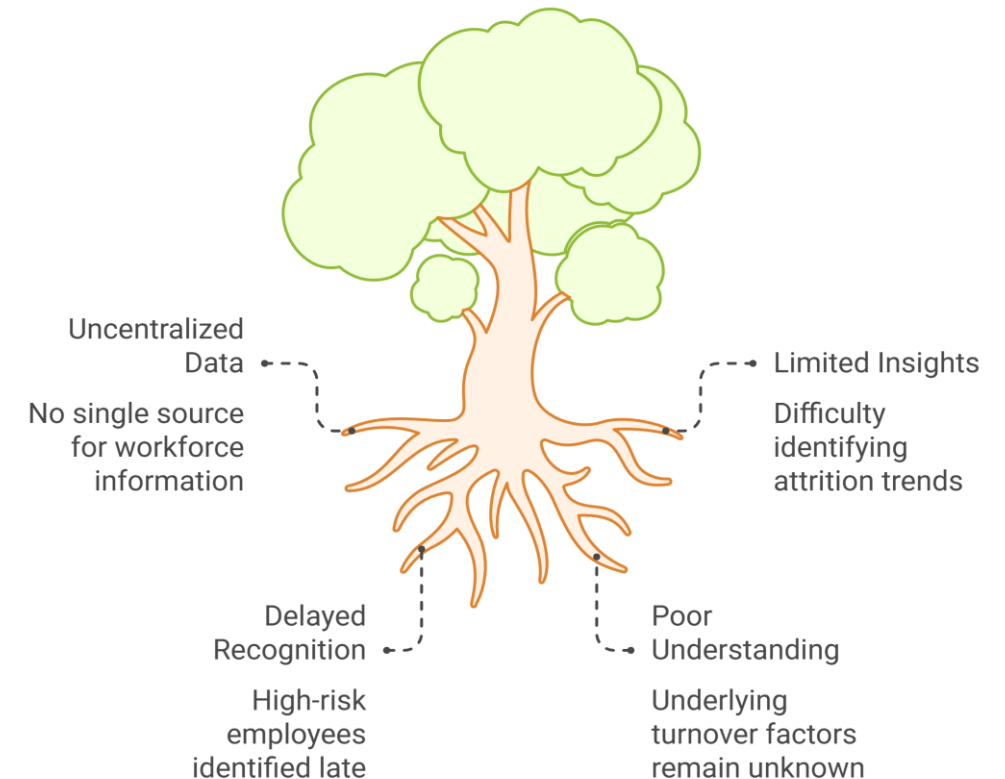
OUTLINE:

- **Problem Statement** (Should not include solution)
- **Proposed System/Solution**
- **System Development Approach** (Technology Used)
- **Algorithm & Deployment**
- **Result (Output Image)**
- **Conclusion**
- **Future Scope**
- **References**

PROBLEM STATEMENT:

Organizational absence of structured, data-driven insights. Human Resource departments often lack a centralized mechanism to monitor workforce composition, attrition patterns, and employee satisfaction indicators. As a result, identifying critical attrition trends across departments, age groups, gender, education background, and job satisfaction levels becomes difficult. This limitation leads to delayed recognition of high-risk employee segments and restricts the ability to understand the underlying factors contributing to employee turnover, ultimately affecting workforce stability and organizational performance. Organizations face increasing challenges in managing employee attrition due to the

Ineffective Attrition Management due to Lack of Data

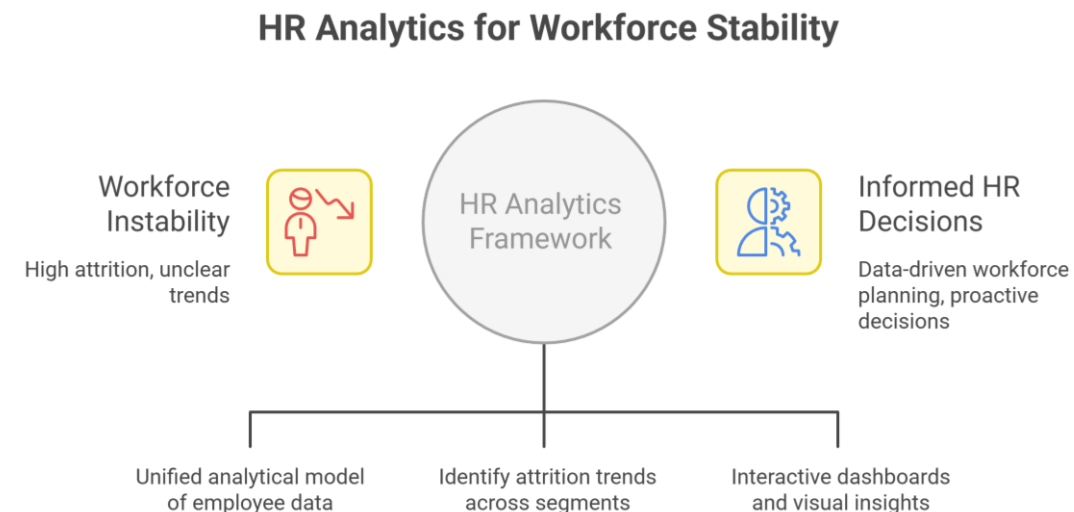


PROPOSED SOLUTION:

The proposed system is an **HR Analytics and Attrition Analysis framework** that analyzes historical employee data to identify key workforce and attrition patterns. It integrates employee demographics, job roles, education background, and job satisfaction into a unified analytical model. Using data aggregation and visualization techniques, the system highlights attrition trends across departments and employee segments, enabling a structured, data-driven understanding of workforce behavior and supporting informed HR decision-making.

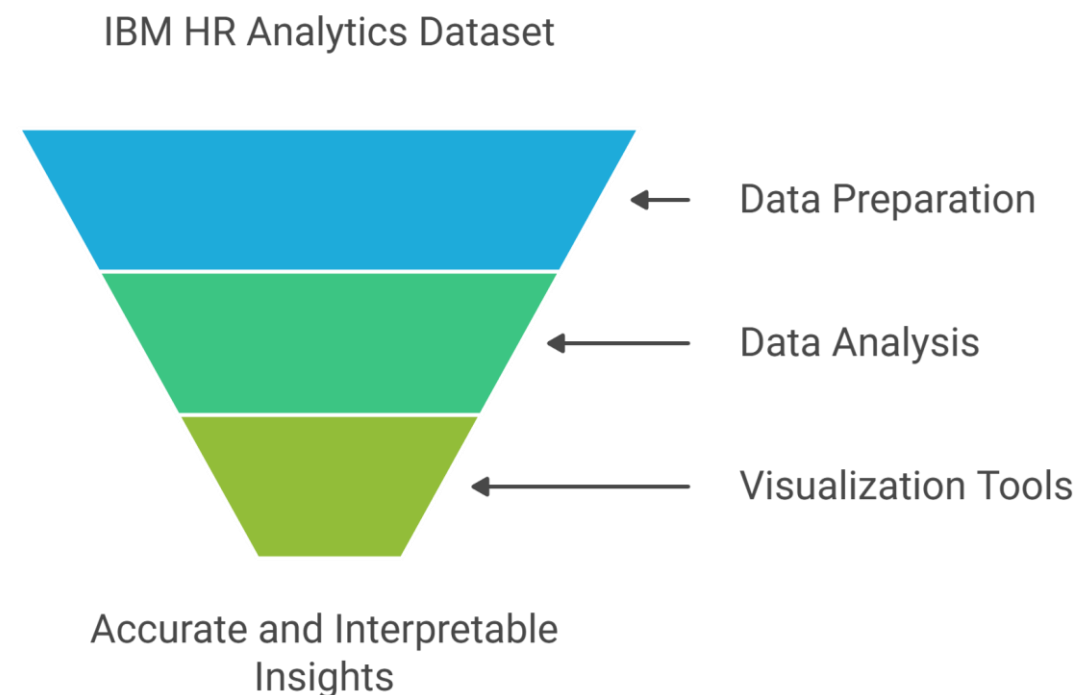
Key Capabilities of the Proposed System:

- Centralized view of workforce composition and attrition trends
- Identification of high-risk employee segments
- Interactive dashboards for clear visual insights
- Support for data-driven and proactive HR planning



SYSTEM APPROACH:

- The system is developed using a structured data analytics approach:
- **Dataset:** IBM HR Analytics dataset containing 1470 employee records
- **Data Preparation:** Data cleaning, filtering, and transformation using Microsoft Excel and SQL
- **Data Analysis:** Statistical and exploratory analysis to identify attrition trends
- **Visualization Tools:**
 - Power BI for interactive dashboards
 - Tableau for visual storytelling and comparative insights
- This approach ensures accuracy, scalability, and ease of interpretation for HR stakeholders.



ALGORITHM & DEPLOYMENT:

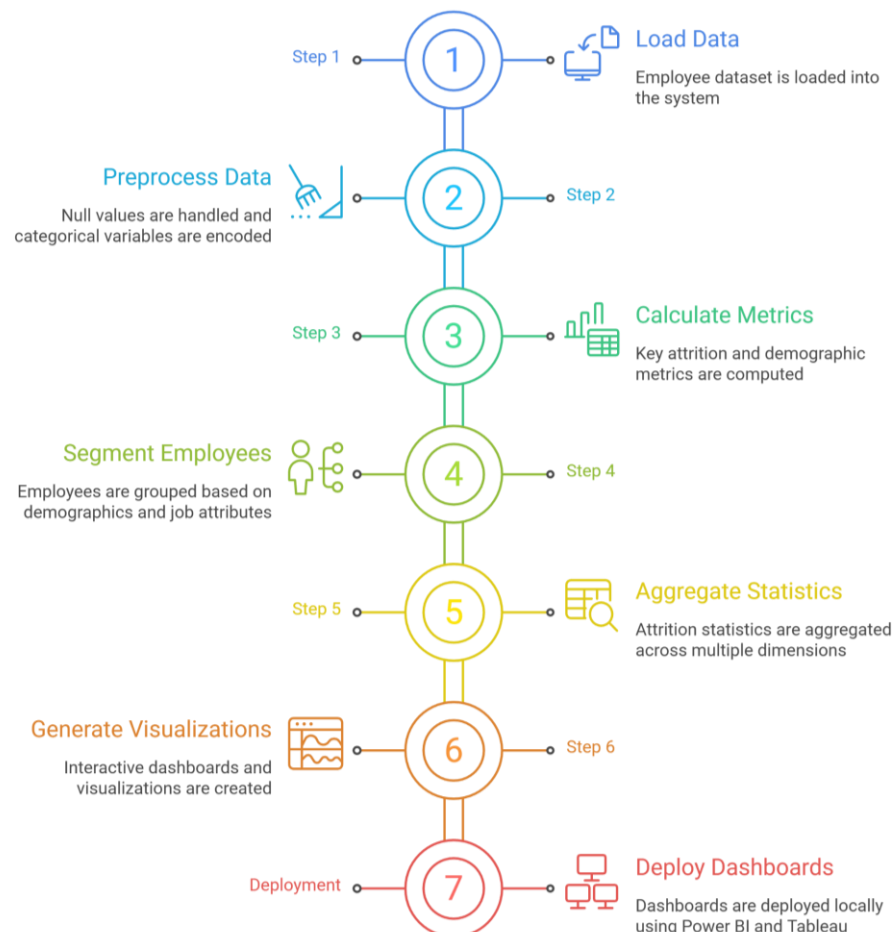
Algorithm Workflow:

1. Load employee dataset
2. Preprocess data (handle null values, encode categorical variables)
3. Calculate key metrics such as attrition rate, age-group distribution, and satisfaction levels
4. Segment employees based on demographics and job attributes
5. Aggregate attrition statistics across multiple dimensions
6. Generate interactive visualizations

Deployment:

- Dashboards are deployed locally using Power BI and Tableau
- Interactive filters allow real-time exploration of attrition patterns
- The system can be extended to cloud deployment for enterprise usage

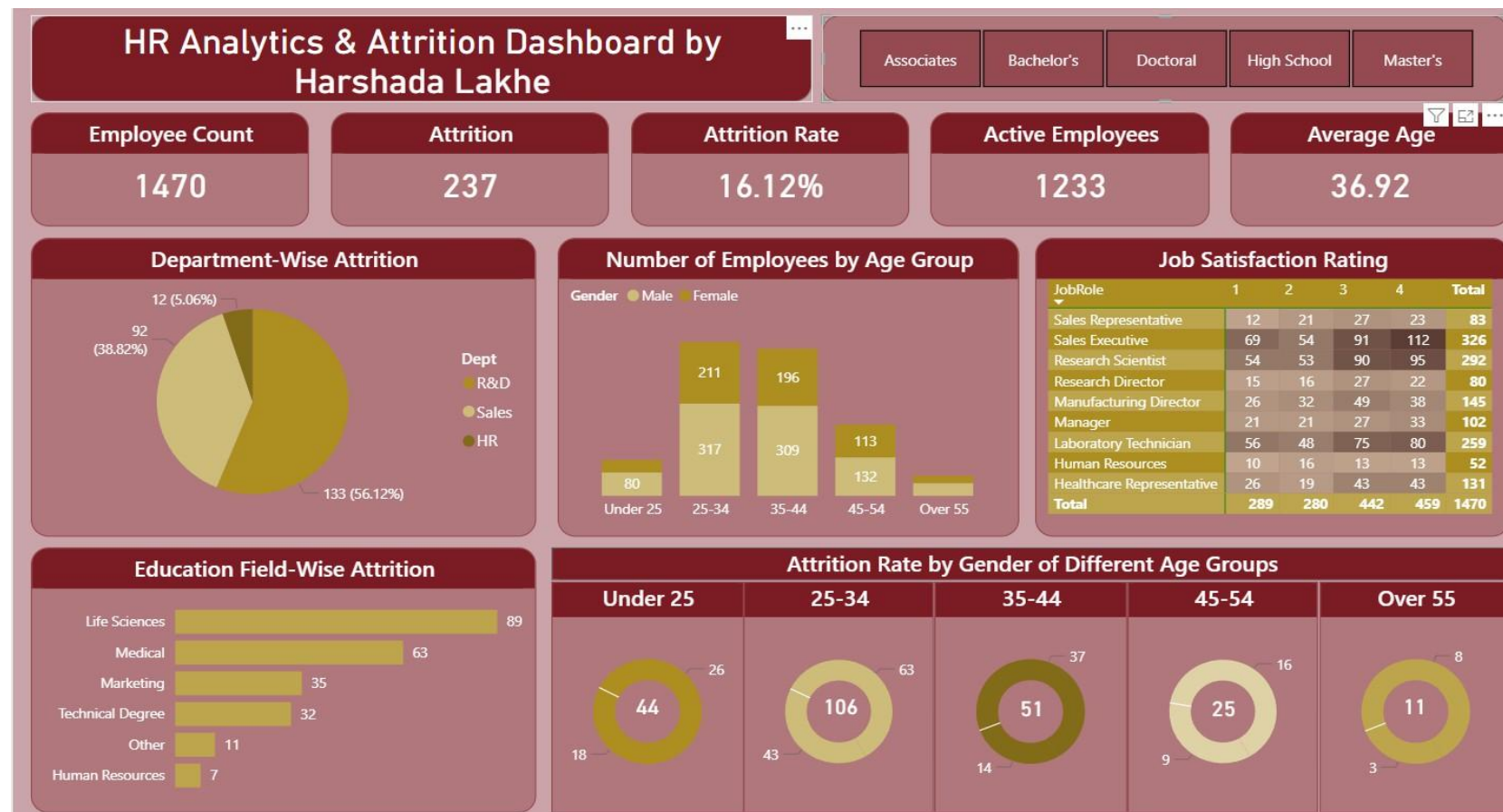
HR Analytics and Attrition Analysis Workflow



RESULT:

Key Results Obtained:

- Overall attrition rate observed: **~16%**
- Highest attrition identified in the **25–34 age group**
- Significant exits from **Life Sciences and Medical education fields**
- Lower job satisfaction (ratings 1–2) strongly correlated with higher attrition
- Attrition patterns vary across departments and gender segments



CONCLUSION:

The HR Analytics and Attrition Analysis system successfully transforms raw HR data into actionable workforce insights. The analysis reveals that attrition is not uniform across the organization and is influenced by age, education background, and job satisfaction. The dashboard provides a consolidated view of workforce health, enabling data-driven understanding of employee turnover trends and supporting informed HR decision-making.

FUTURE SCOPE:

- Integration of **predictive machine learning models** to forecast employee attrition
- Real-time HR data integration from enterprise HRMS platforms
- Role-based dashboards for managers and HR leaders
- Inclusion of compensation, performance, and work-life balance metrics
- Cloud-based deployment for scalability and multi-organization access

REFERENCES:

- IBM HR Analytics Employee Attrition Dataset
- Power BI Documentation
- Tableau Official Documentation
- SQL and Excel Data Analysis References

Github Link : [LINK](https://github.com/harshada006/HR-Analytics-Attrition-Analysis)

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Thank You