Analysis Report

Research Findings

1. **Age Dynamics:** Attrition rates exhibit variation among different age cohorts, with persons aged 28-32 experiencing the highest attrition. This pattern diminishes as individuals age, suggesting a transition towards employment security and enduring obligations as they advance in their professional paths.

2. **Income Levels:** Attrition rates are impacted by income levels, with notable surges at extremely low income levels and a progressive decline as income increases. This emphasises the significance of maintaining financial stability in order to retain employees.

3. **Job satisfaction** is inversely related to attrition rates, especially with employees earning an average monthly salary of 4596. On the other hand, employees who earn 6853 and have greater satisfaction ratings are more likely to stay with the company.

4. There are differences between **departments** in terms of attrition rates. The Sales department has the greatest attrition rate, followed by Human Resources. On the other hand, Research and Development have lower attrition rates. This indicates disparities in work culture, opportunity, and levels of satisfaction among different departments.

5. The impact of **job roles** on attrition rates reveals that higher-level positions had lower rates of employee turnover in comparison to lower-level positions. This suggests that career advancement opportunities and work stability play a crucial role in retaining talented individuals.

6. **The impact of Salary Hike:** Increasing salaries significantly incentivizes employee retention, motivating them to improve their performance and maintain their commitment to the organisation.

7. **Education:** People who have obtained advanced degrees, such as master's and doctorate degrees, are less likely to leave their jobs. This shows that having specialised skills and advanced qualifications is important for job satisfaction and staying in a job.

	Model	ROC-AUC	Precision (Attrition)	Precision (No Attrition)	Recall (Attrition)	Recall (No Attrition)	F1 Score (Attrition)	F1 Score (No Attrition)
0	Logistic Regression	80.13%	0.78	0.84	0.86	0.73	0.82	0.78
1	Random Forest	82.98%	0.84	0.88	0.89	0.82	0.86	0.85
2	SVM	85.47%	0.82	0.85	0.87	0.79	0.84	0.82
3	Decision Tree	79.98%	0.80	0.80	0.82	0.79	0.81	0.79

Observations:

- Roughly 10% of employees depart from the organisation once they have completed 2 years of service.
- Individuals who are obligated to work more hours over their regular job schedule exhibit a greater probability of resigning in comparison to those who are not obliged to do so.
- People who reside more away from their office are more likely to quit their job compared to those who live closer.
- Employees who have a track record of working at several organisations in the past are more likely to leave their current company compared to their colleagues.
- Employees who demonstrate loyalty, receive greater compensation, and take on additional tasks are less likely to leave their positions in comparison to their colleagues.
- Employees who travel frequently for work have a greater tendency to depart their jobs compared to their colleagues.
- A substantial fraction of individuals that leave the dataset are sales agents.

Challenges Encountered:

Choosing the columns that do not impact Attrition was challenging and required thorough analysis to eliminate columns that would not enhance the accuracy of our models.

The dataset is imbalanced, with a higher number of instances labelled as "No" for Attrition compared to instances labelled as "Yes". We resampled our Dataset by utilising SMOTE oversampling to upscale the "Yes" values. Our goal was to strike a compromise between the number of data items and the risk of overtraining our model. I conducted a search for various algorithms, such as the near miss method and SMOTE, and then chose the most suitable one for the case at hand.

Choosing precise Data visualisation is used to accurately analyse the dataset by focusing on specific columns.

Partitioning our dataset into training and testing datasets with appropriate proportions to yield best outcomes.

Recommendations:

- Handle Workload and Work-Life Balance: Keep an eye on workload levels and ensure staff members are not required to put in unduly lengthy hours. Put in place measures to encourage work-life balance, such as flexible schedules, remote work possibilities, or programs to cut down on overtime needs.
- Consider how employees' commute distance affects their job happiness and retention while deciding where to work. Investigate possibilities like flexible scheduling, telecommuting, or relocation help to lessen the difficulties related to lengthy commutes.
- Implement recognition programs to recognize and reward performance, loyalty, and readiness to take on more responsibility. Performance-based bonuses, public acclaim, or chances for professional growth might all fit under this.
- Implementing salary adjustments, performance-based incentives, or financial well-being programmes could effectively alleviate financial strain and enhance employee retention.

These are some recommendations to reduce attribution rate.