Employee Attrition Prediction

Using IBM HR Analytics Data ML Classification Techniques

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Employee Attrition Prediction with Machine Learning

This presentation explores predicting employee attrition. We use IBM HR Analytics data. The goal is to identify factors influencing employee turnover.

Data Overview

1,470

Employees

Total records analyzed.

35

Features

Categorical and numerical attributes.

84%

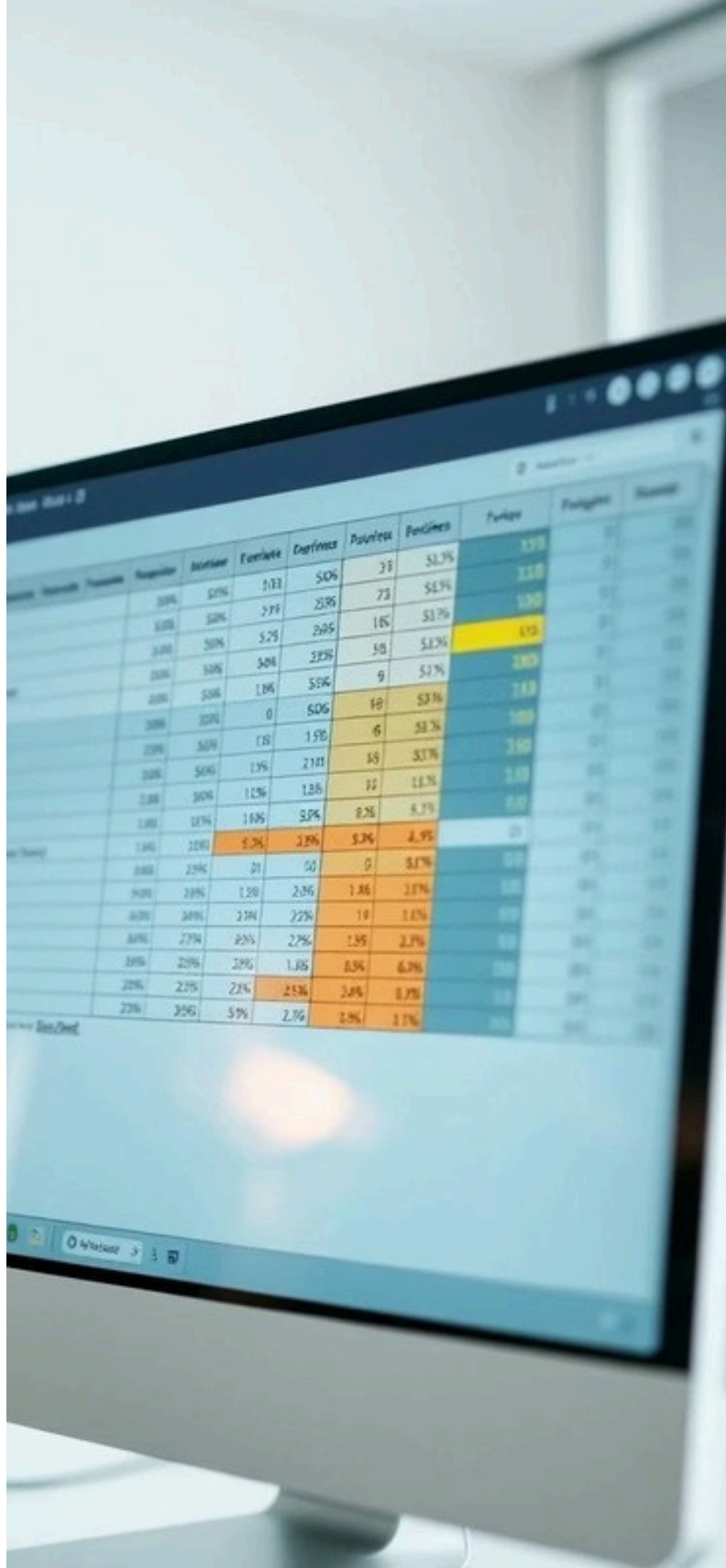
Active

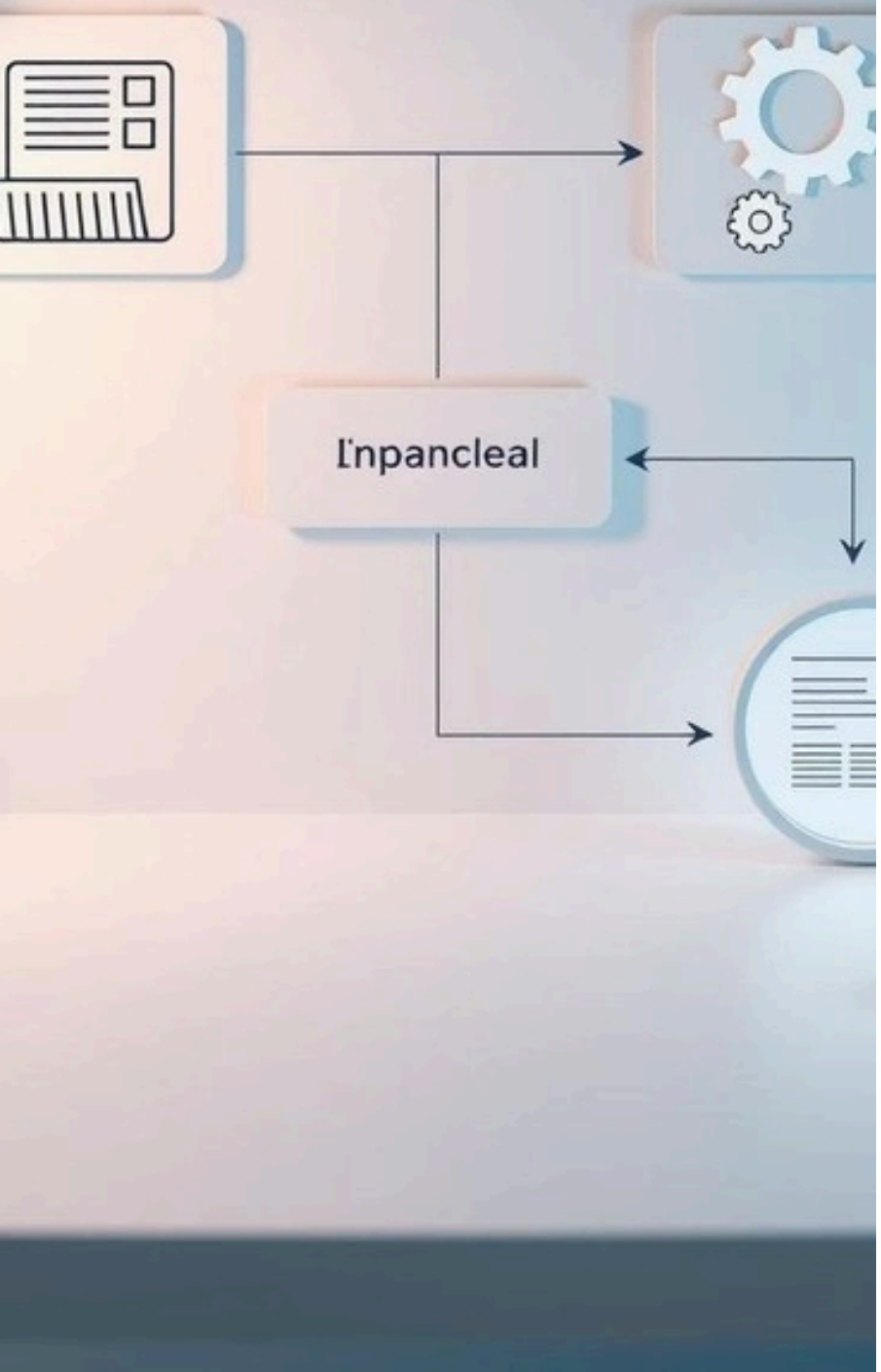
Employees remaining with the company.

16%

Attrited

Employees who left the company.





Data Preprocessing and Feature Engineering

1

Handle Missing Values

Impute any missing data points.

2

Encode Categorical Variables

Apply One-Hot Encoding.

3

Feature Scaling

Use Standardization for consistent ranges.

4

Address Class Imbalance

Utilize SMOTE oversampling technique.

Model Selection and Training

Model Types

- Logistic Regression
- Random Forest
- Gradient Boosting

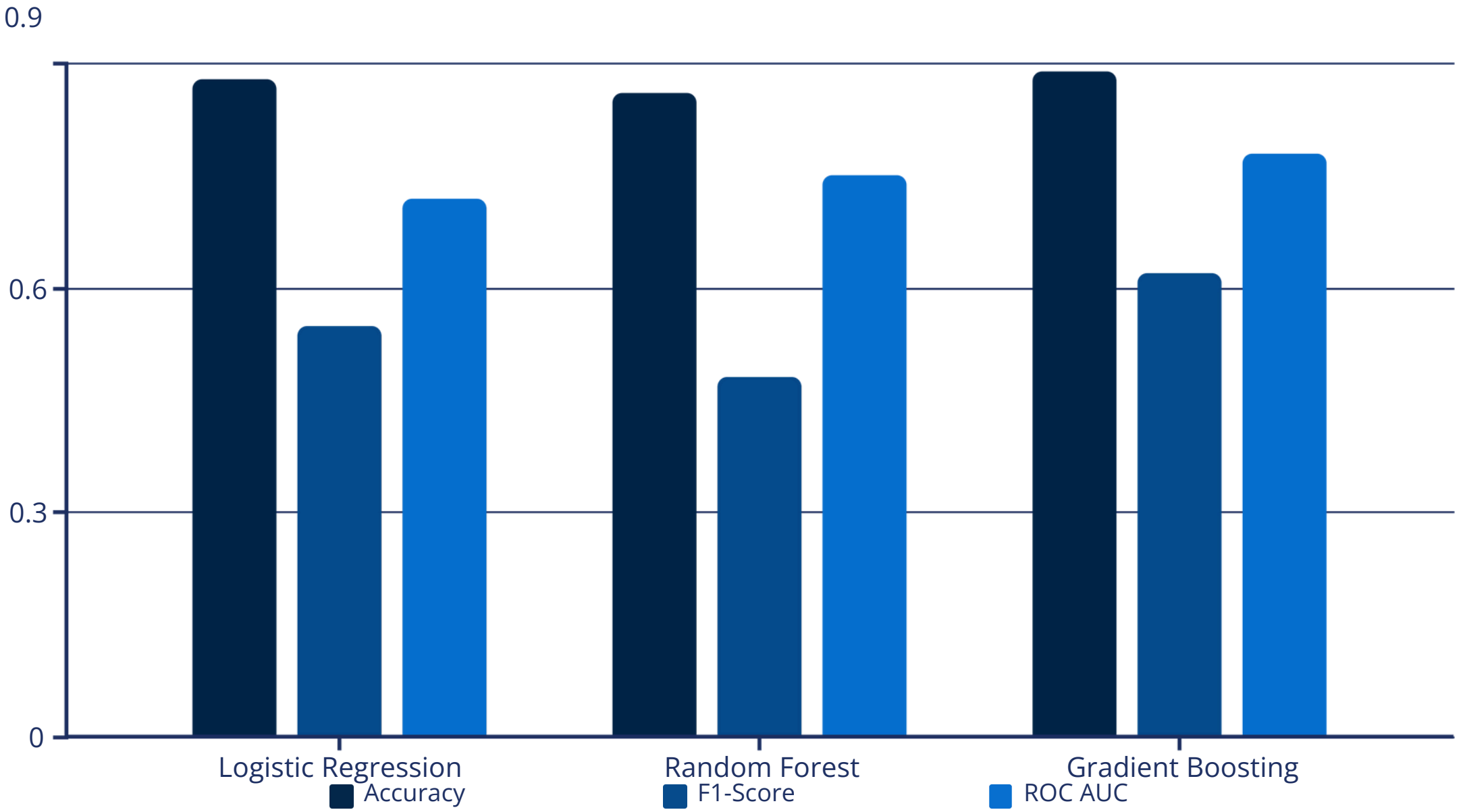
Data Splitting

- Training Set: 80%
- Test Set: 20%

Tuning & Evaluation

- GridSearchCV for hyperparameters
- Accuracy, Precision, Recall, F1-score, ROC AUC

Model Evaluation and Comparison



Gradient Boosting achieved the highest ROC AUC score. This indicates superior predictive capability. It also outperformed other models in F1-score.

Feature Importance Analysis

1 Overtime
Importance: 0.12, highest impact.

2 Job Level
Importance: 0.09, significant factor.

3 Monthly Income
Importance: 0.08, third most impactful.

4 Age
Importance: 0.07, a key demographic.

5 Years At Company
Importance: 0.06, tenure matters.

Actionable Insights

Work-Life Balance

High overtime correlates with attrition.

Career Advancement

Low job level is a driver.

Employee Engagement

Younger employees and short tenure are risks.

Competitive Salaries

Lower income increases attrition risk.

Conclusion

Effective Prediction
ML models accurately forecast attrition.

Key Insights
Feature importance reveals critical factors.

Proactive HR
Analytics enables strategic retention.