

Business Analytics

Final Project: Sterling Bank Nigeria PLC Branches Assessment

Presented by :

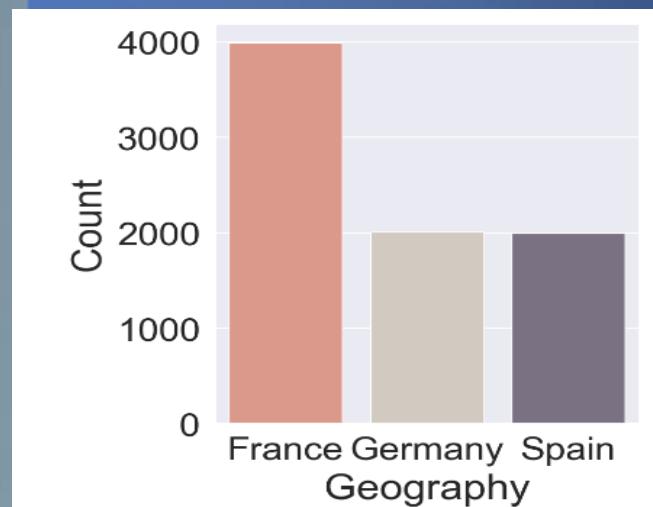
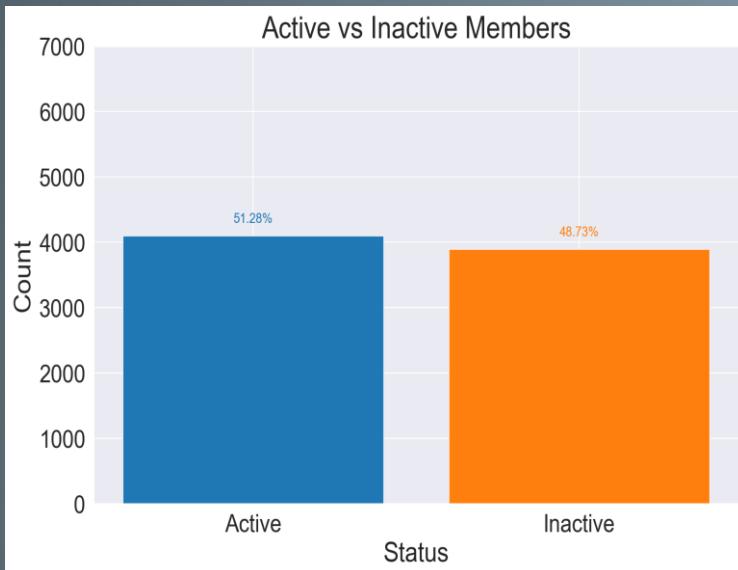
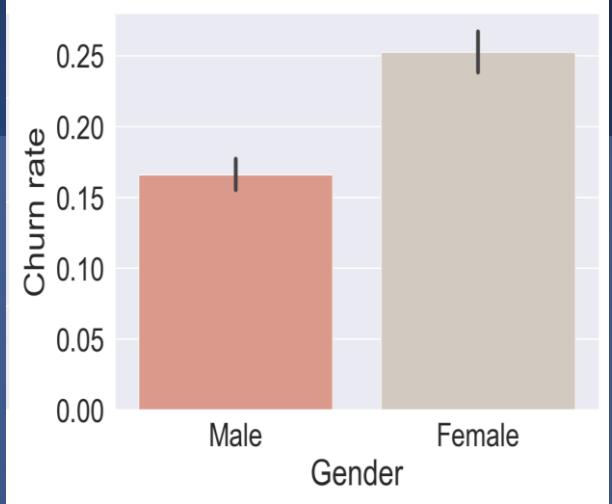
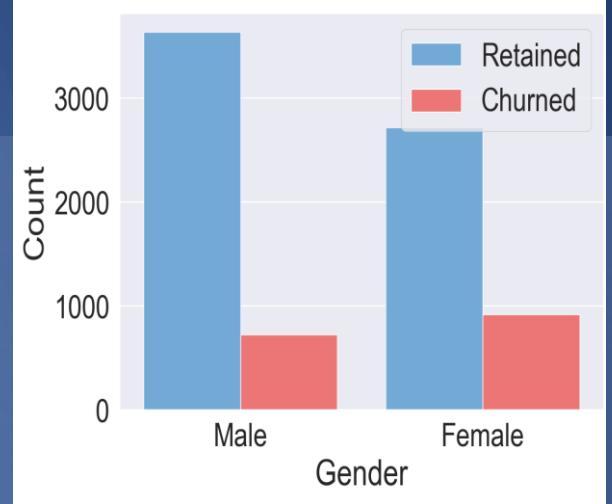
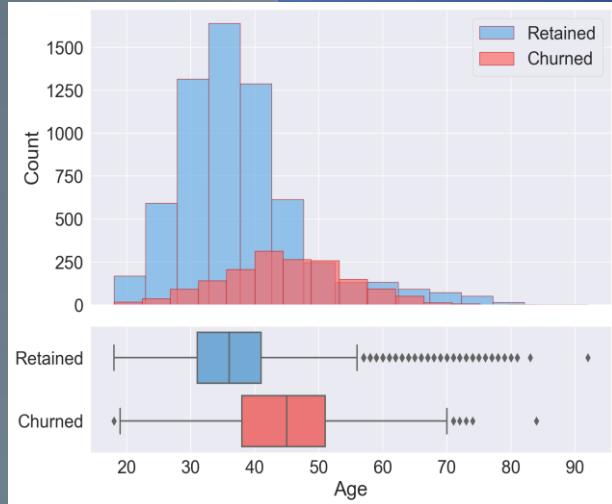
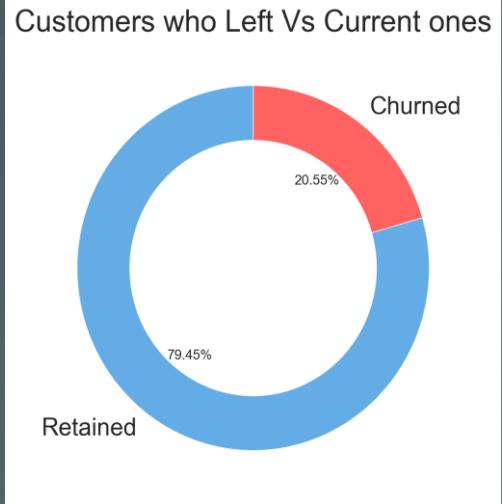
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Key Performance Indicators

- Customer satisfaction from Scores
- Transaction volume
- Customer retention rates for each branch(Customer churn analysis)
- Revenue generation
- Branch profitability
- Active and Inactive members in different Branches

Real world Scenario: Key Performance Indicators

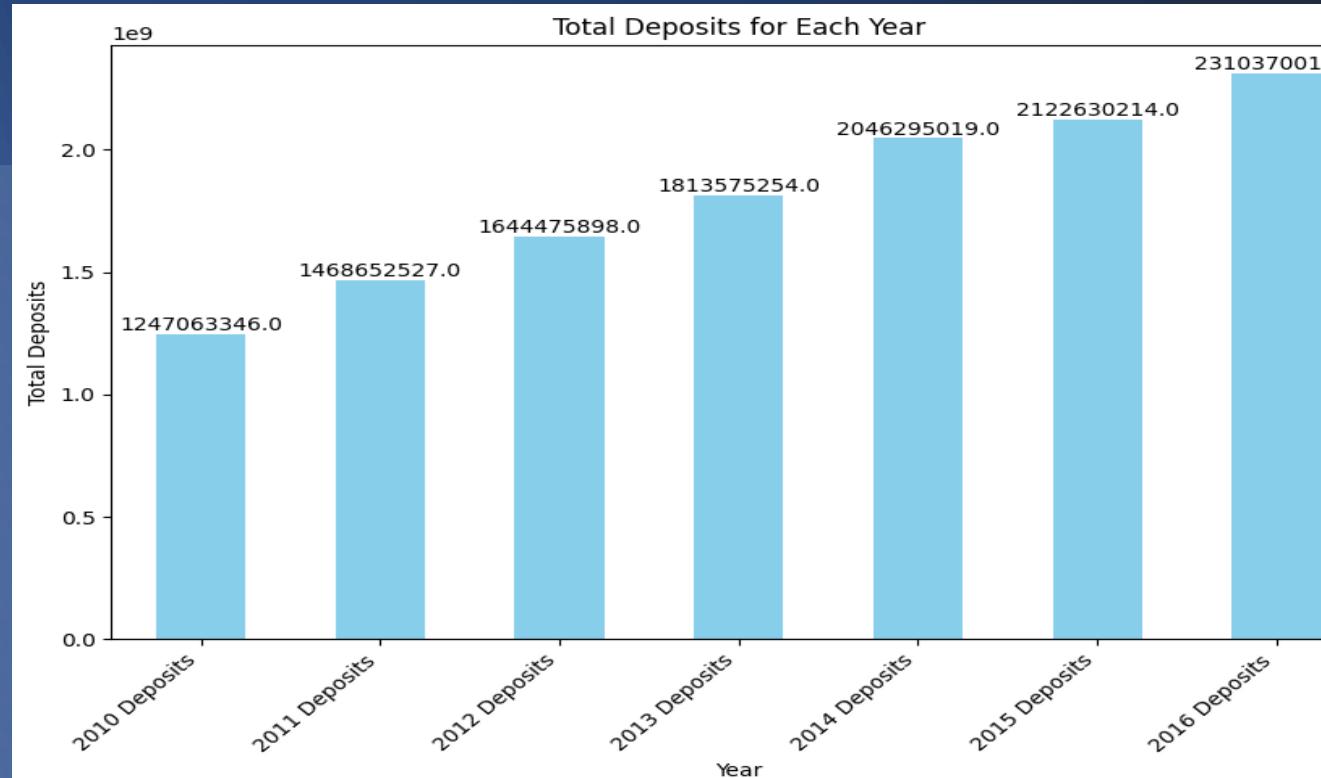
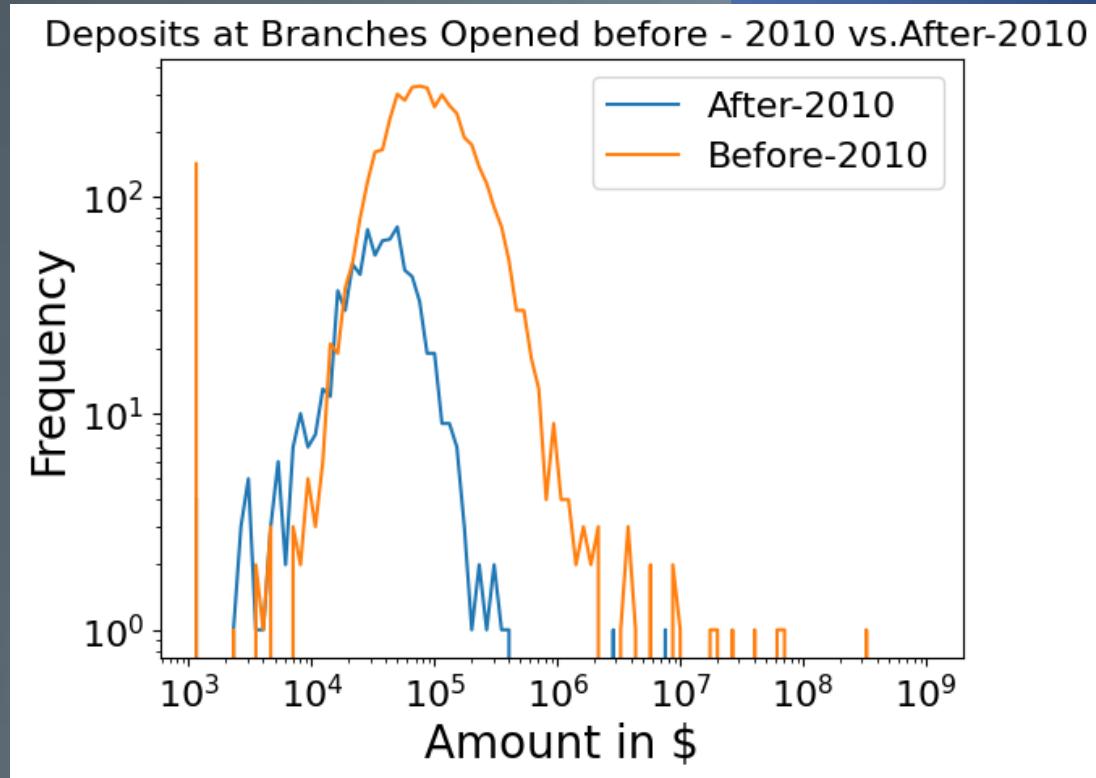


The bank retained 80% of Clients. Older clients have a higher chances to churn. Female Customers are more likely to churn as compared to Male customers. Customers who are active and inactive are balanced. France is the region with the most customers.

Use of Business Analytics to identify trends and patterns

- Exploratory Data Analysis
- Timeseries analysis
- Predictive analytics
- Machine learning Algorithms
- Real time analytics
- Diagnostic Data analysis.

Real world Scenario: Identifying trends and patterns



- Branches opened after 2010 have lower deposits as compared to branches opened before 2010

- There is a positive trend in the amount of savings from the year 2010 to 2016

Communication using Data Visualization Techniques

- Use Tableau, seaborn libraries and Power Bi to generate visually appealing dashboards.
- Commonly used data visualization techniques are:
 - Bar charts and column charts
 - Pie charts and doughnut charts
 - Scatter plots
 - Heatmaps
 - Boxplots
 - Histogram
 - Waterfall charts

Real world Scenario: Insights from Data Visualization

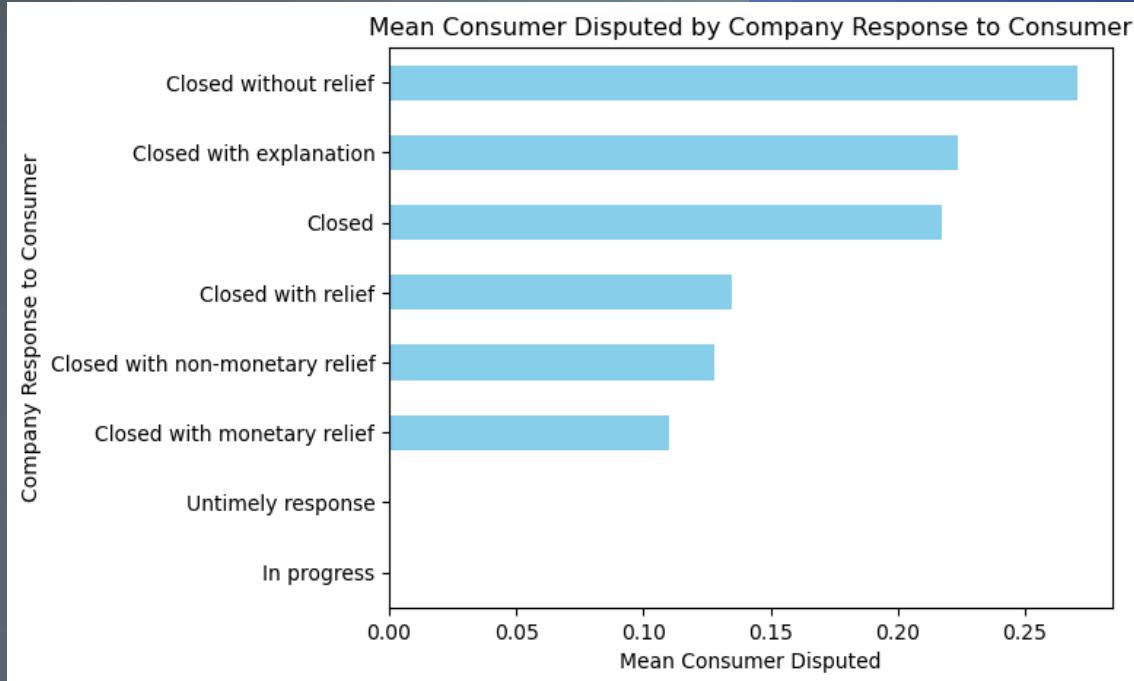


- From the heatmap visualization shown, There is no significant intercorrelation between the variables, meaning there is no problem of multicollinearity in the dataset.
- Such visualization are great tools to visualize and make decisions about the dataset

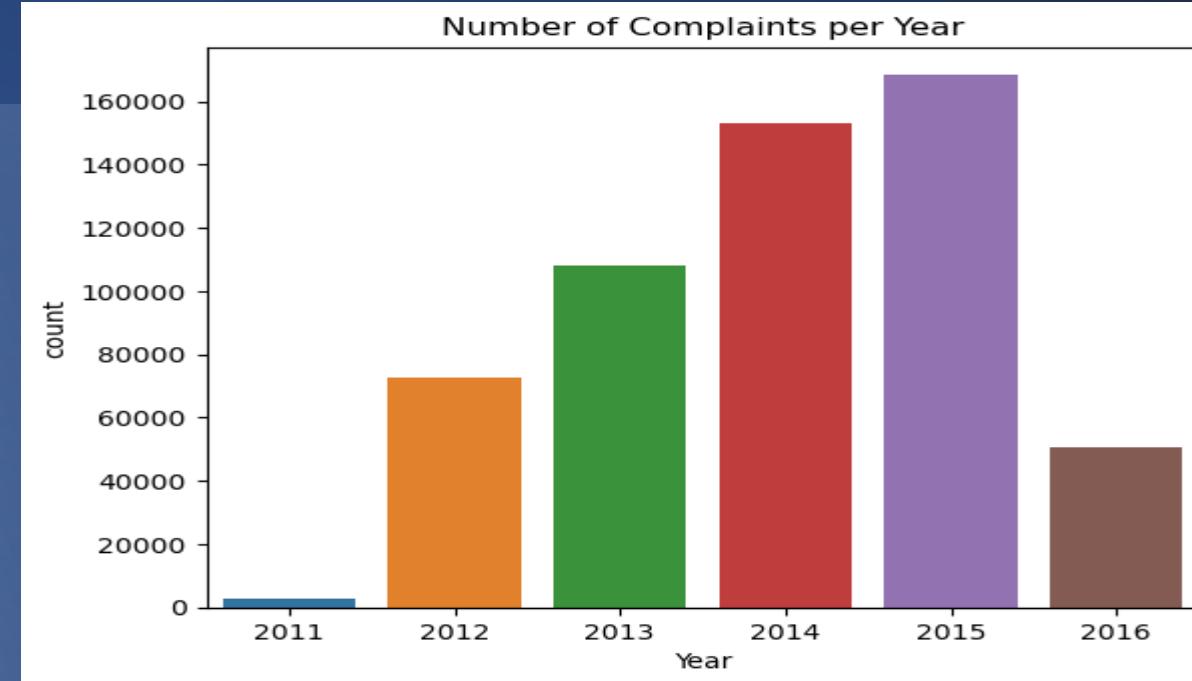
Customers Feedback Collection and Analysis

- Implement surveys, social media monitoring, and sentiment analysis tools to collect and analyze customer feedback.
- Identify areas for improvement based on customer comments and sentiments.

Real world Scenario: Analysis of Customer Feedback



- On Average, most of the complaints have been closed without relieve at 0.25 per company response to consumer



- On Analysis of number of complaints per year, 2015 is the year with the highest complaints, and 2011 has the least complaints

Predictive Analytics for Future Performance

- Use predictive modeling to forecast future performance and identify potential growth areas.
- Analyze historical data to predict customer behavior, sales trends, and other relevant metrics.
- This will give a direction to management on areas to focus on and to assist them make informed decisions.

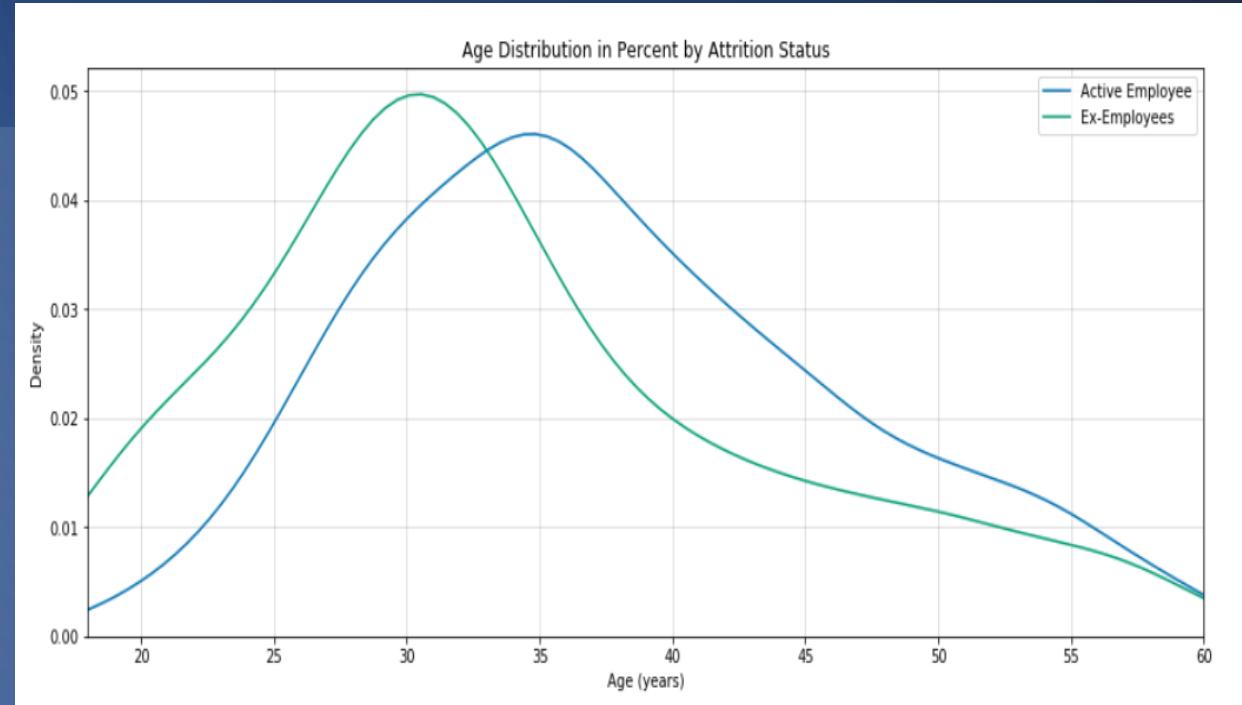
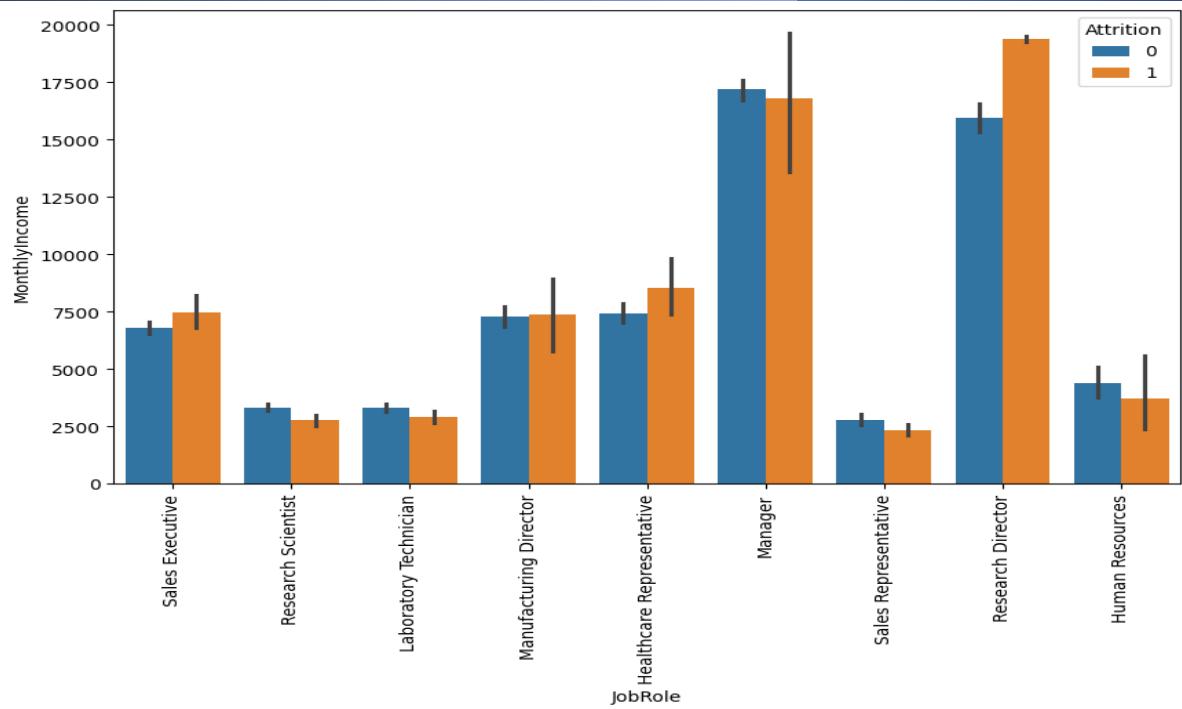
Bank Operations Efficiency and Improvement areas

- Use predictive modeling to forecast future performance and identify potential growth areas.
- Analyze historical data to predict customer behavior, sales trends, and other relevant metrics.
- Regular training to staff on Business Analytics techniques
- Identify the existing gaps on operations and make use of analytics to bring solutions.

Employees Analytics

- Use analytics to evaluate employee performance by analyzing metrics like transactions processed, cross-selling success, and customer satisfaction within each branch.
- Identify training needs and optimize staffing levels.
- Data Analytics is also used to evaluate the number of employees who are leaving the organization vs the current employees and years of service.

Real world Scenario: Employee Analytics



- Customer satisfaction from Surveys

- Customer satisfaction from Surveys

Marketing Impact Assessment

- Analyze the impact of marketing and promotional efforts by correlating marketing campaigns with changes in transaction volumes, new customer acquisitions, and overall branch revenue.
- Review the existing marketing strategies and update new strategies that are customer centric focused.
- Use real time analytics to stay up to date on market trends and patterns.

Risks, Challenges and Ethical Issues

- Identify potential risks and challenges, such as data privacy concerns and bias in analytics models.
- Establish ethical guidelines for data usage and implement measures to ensure fair and transparent analytics practices.
- Create a secure database to control ransomware and malware attacks
- Human error and social engineering.

Mitigation Strategies

- Regular trainings on data ethics and protection for analytics teams.
- Establish clear data governance policies for data collection, storage, and usage.
- Regularly update analytics models to adapt to changing business conditions.
- Implement secure data storage and transmission protocols to protect sensitive personally identifiable information.
- Foster a culture of transparency in data analytics practices within the organization.

Data Accuracy and Reliability

- Select the best performing model that gives accurate prediction of results from the customers dataset.
- Regular trainings on data ethics and protection for analytics teams.
- Establish clear data governance policies for data collection, storage, and usage to protect sensitive personally identifiable information.
- Regularly update analytics models to adapt to changing business conditions.
- Foster a culture of transparency in data analytics practices within the organization.

Real world Scenario: Implementing Accuracy and Reliability

- To ensure accuracy and reliability scores, different machine learning models are tested, and best performing model is chosen.

XG Boot Model

Classification Report				
	precision	recall	f1-score	support
0	0.81	0.95	0.87	41520
1	0.69	0.34	0.46	14318
accuracy			0.79	55838
macro avg	0.75	0.64	0.66	55838
weighted avg	0.78	0.79	0.77	55838

Decision Tree Model

Classification Report				
	precision	recall	f1-score	support
0	0.77	0.97	0.86	41520
1	0.63	0.17	0.26	14318
accuracy			0.76	55838
macro avg	0.70	0.57	0.56	55838
weighted avg	0.73	0.76	0.70	55838

Random Forest Model

Classification Report				
	precision	recall	f1-score	support
0	0.77	0.98	0.86	41520
1	0.70	0.14	0.23	14318
accuracy			0.76	55838
macro avg	0.73	0.56	0.54	55838
weighted avg	0.75	0.76	0.70	55838

Neural Network Model

Neural Network:				
	precision	recall	f1-score	support
0	0.79	0.94	0.86	41520
1	0.64	0.29	0.40	14318
accuracy			0.78	55838
macro avg	0.72	0.62	0.63	55838
weighted avg	0.75	0.78	0.74	55838

- XG Boost model gives the best accuracy score of 79% followed by Neural Network with an accuracy of 78%. These are the two models that can be employed at production

References

Prakhar Rathi. 2021. Banking Dataset - Marketing Targets. Kaggle Dataset

<https://www.kaggle.com/datasets/prakharrathi25/banking-dataset-marketing-targets/data>

Hamza B. 2019. Employee Churn Model. Kaggle Dataset

<https://www.kaggle.com/code/hamzaben/employee-churn-model-w-strategic-retention-plan>

Abir Chakraborty. 2023. Consumer Complaints Resolution. Kaggle Dataset

<https://www.kaggle.com/code/ac1414/consumer-complaints-resolution>