NBM CUSTOMERS CHURN ANALYSIS

BY

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1.0 INTRODUCTION

National Bank of Malawi plc is the largest Bank in Malawi and controls a large customer base. The Bank had **675,654** customers as at September 2021. Out of this number, **372,669** were active while **302,986** churned. This represent **44.8%** churn rate which is too high. (Customer churn also known as customer attrition, customer turnover, or customer defection, is the loss of clients or customers).

1.1 Why should NBM worry about customer churn?

Customer churn rate is a key business metric in any industry and company providing services to end customers. This is because the cost of retaining an existing customer is far less than acquiring a new one. By addressing churn, a company may not only preserve its market position, but also grow and thrive. As a matter of fact, a company cannot succeed if it is not focusing on reducing client attrition and implementing effective retention strategies.

1.2 What should NBM do to reduce churn?

(To reduce customer churn, the Bank need to predict which customers are at high risk of churn)

Individual customer retention may be hard in a company with large number of customers like NBM. The cost of devoting much time to each customer would outweigh the additional revenue. The best option would be to forecast which customers are likely to leave ahead of time and come up with special customer retention efforts targeting these high risk customers. The ultimate goal is to retrieve more customer loyalty which eventually prevent customers from leaving a company in favor of another.

1.3 What is the objective of this study?

This study is using the NBM customer data set to develop a historical view of customers and their interaction across key delivery channels. Customers are then grouped into two groups; those that churned and those retained. Using key features of customers that churned, we will develop a model that will identify potential churners from the group of customers retained. This will help the Bank to find ways of preventing potential churners from churning.

2.0 THE APPROACH

Using jupyter notebook (anaconda) and Python as our programming language, we will follow the approach demonstrated in **fig1** to achieve our objective.

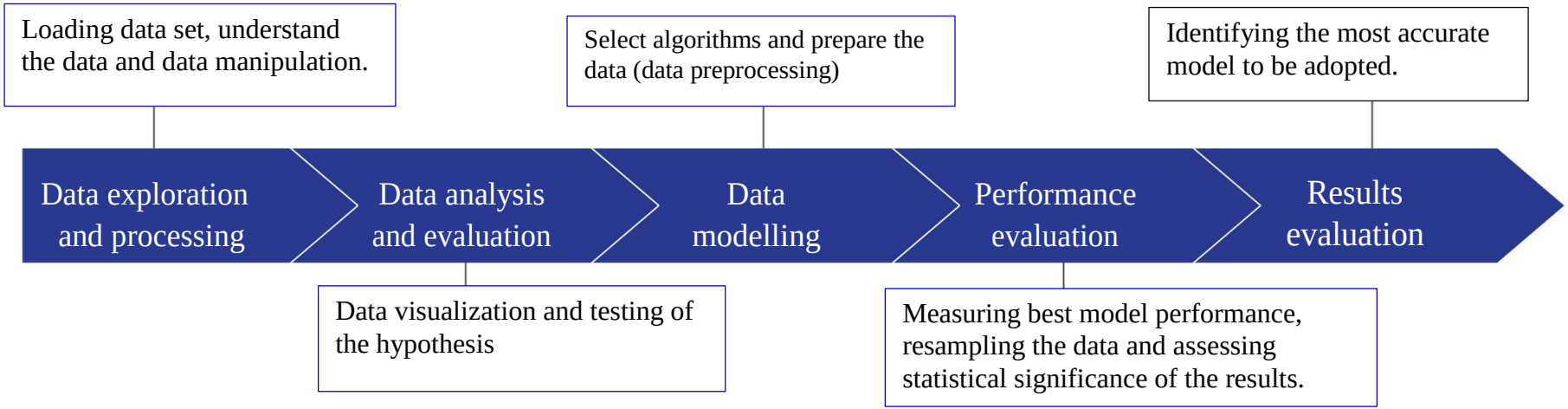
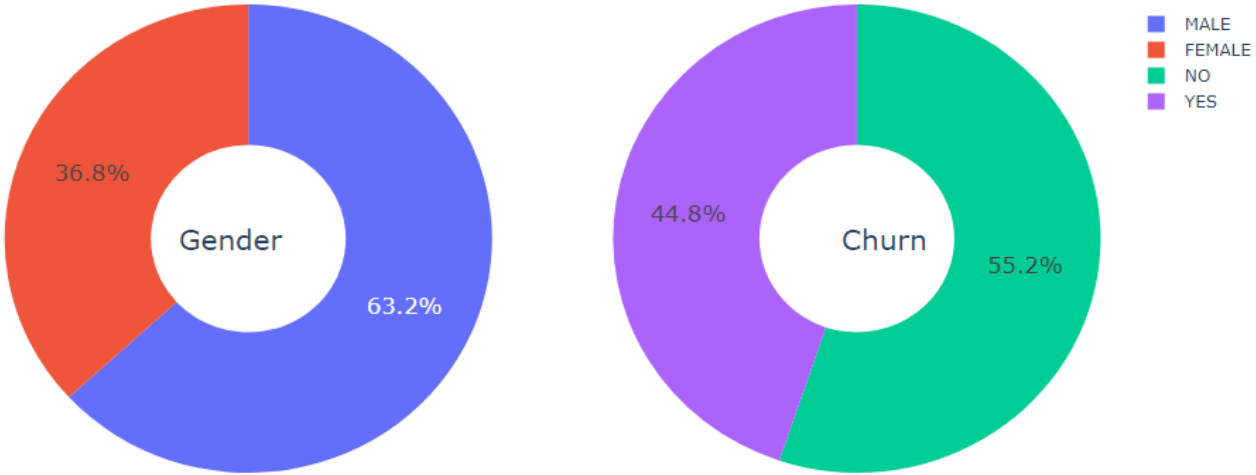


Fig 1: NBM customers churn analysis approach

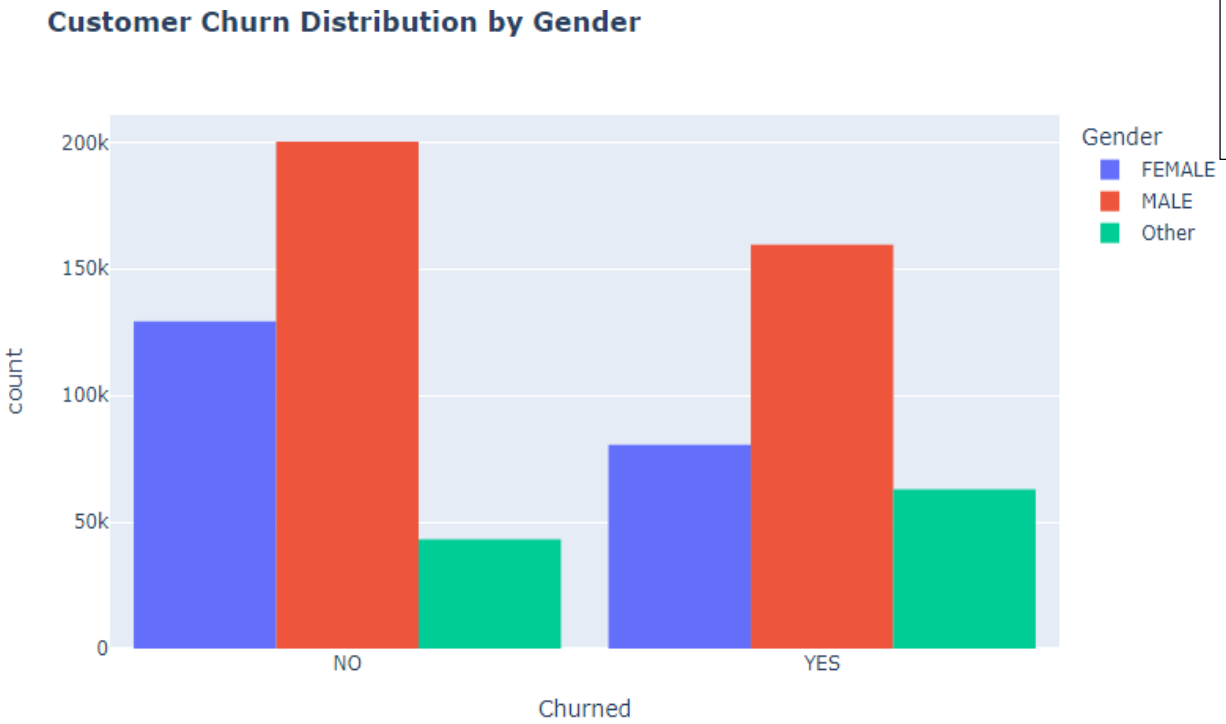
3.0 DATA ANALYSIS

Gender and Churn Distributions



The data set has 36.8% female and 63.2% male customers.

44.8% of customers churned and 55.2% were retained



CHURN BY GENDER			
	Female	Male	Other
Retained	129,276	200,257	43,136
Churned	80,540	159,514	62,932
Total	209,816	359,771	106,068
Churn%	**38.4%**	**44.3%**	**59.3%**

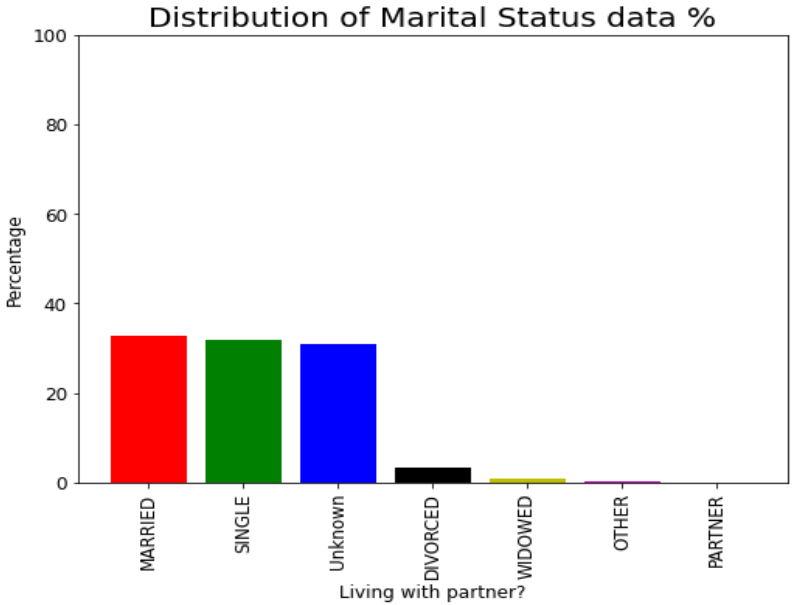
38.4% female, 44.3% male and 59.3% non-individual (Other) customers churned.

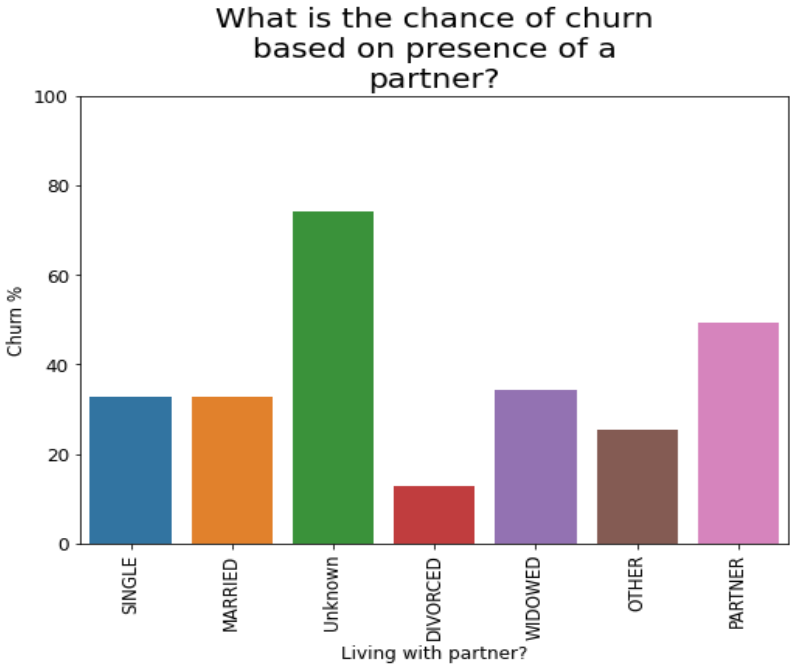
The margin of churn in male and female customers is negligible, the rate of churn in these two groups is the same.

Churn is higher than retention in non-individual

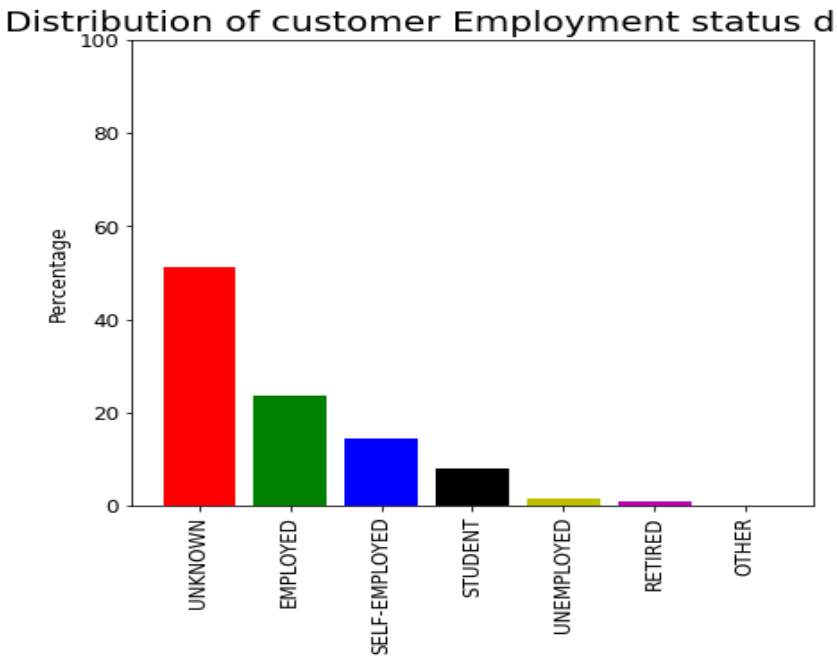
The number of Married, Single, and Unknown (marital status not known) is almost the same. Churn is also the same (37%) in the married and single customers but high (76%) in the unknown group.

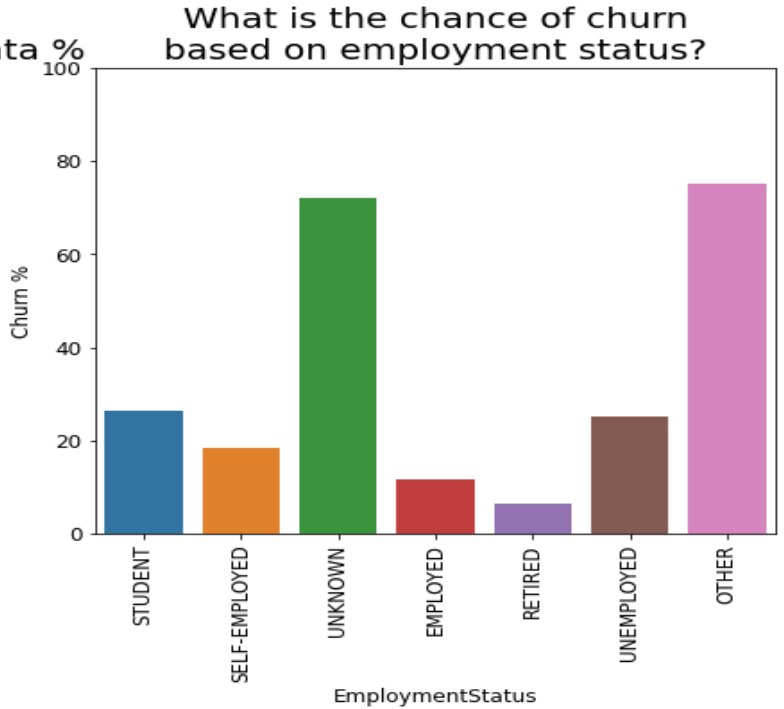
The number of widowed and with patners is very small but churn also on the high side.



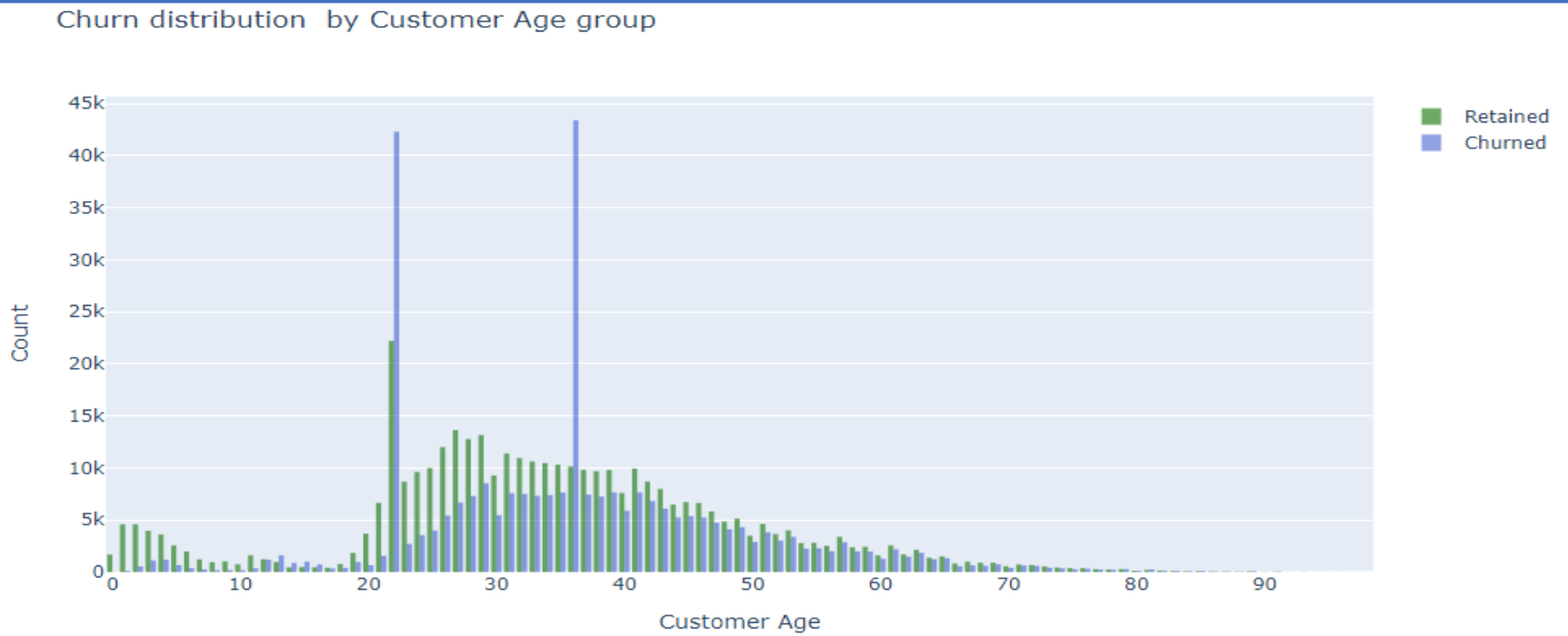


Churn is high in those whose employment status is not known and ‘OTHER’ which represent non individual.

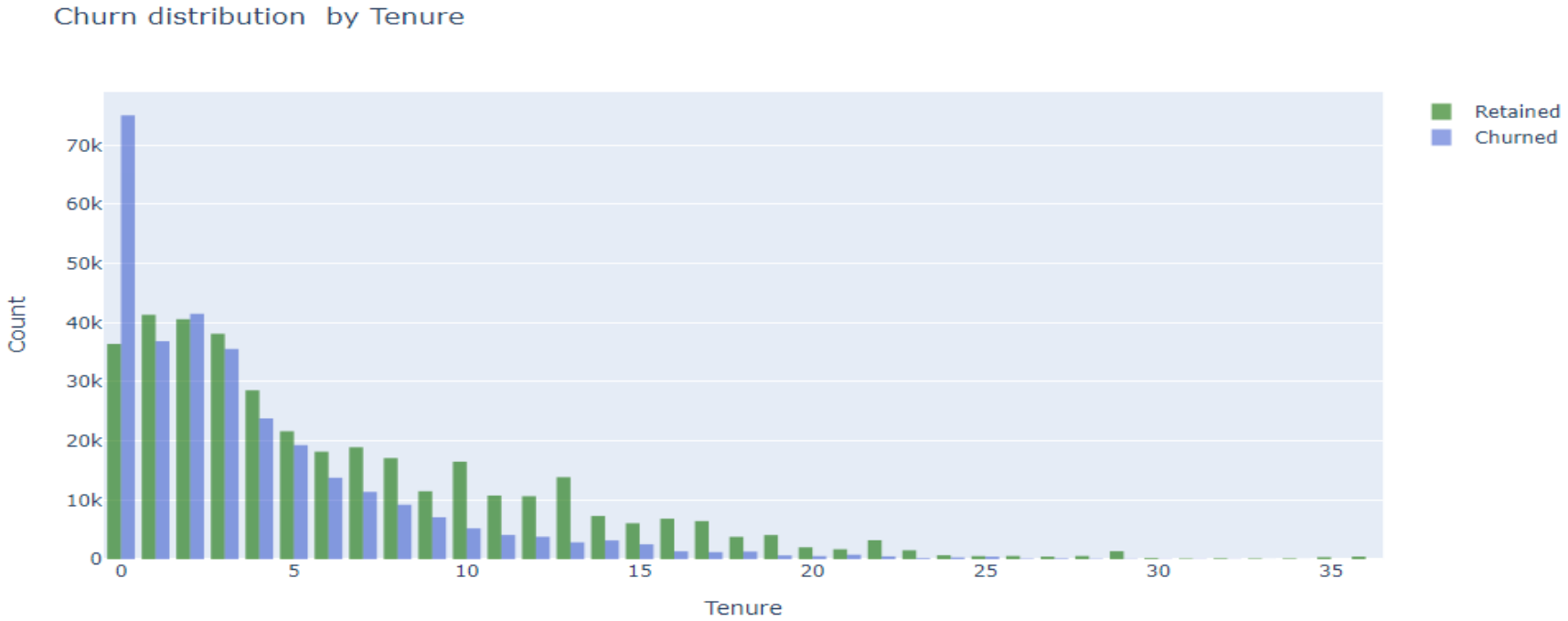


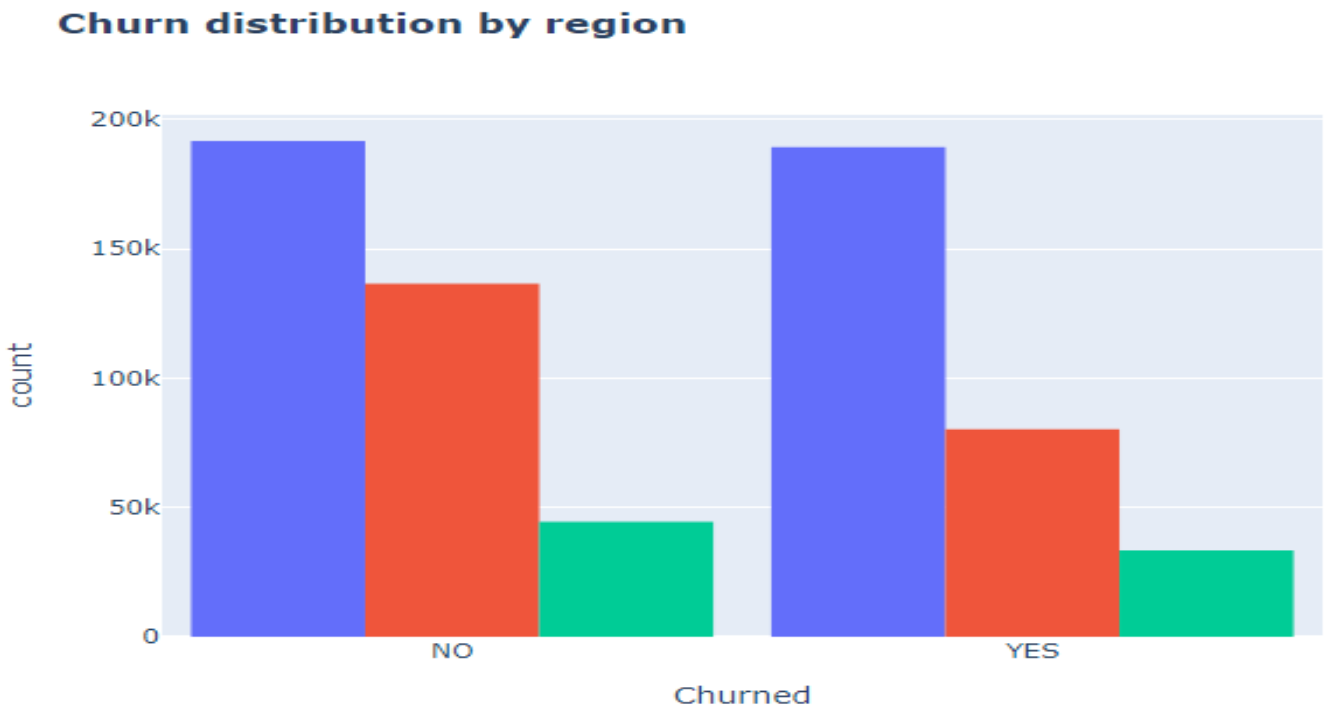


Most customers are between 20 and 50 years. There is a large number of customers aged 22 and 36 and these are the only age groups with churn rate too high. Both number of retained and churn is increasing from Age 20. At age 32 to 40 both churn and retention remain constant.

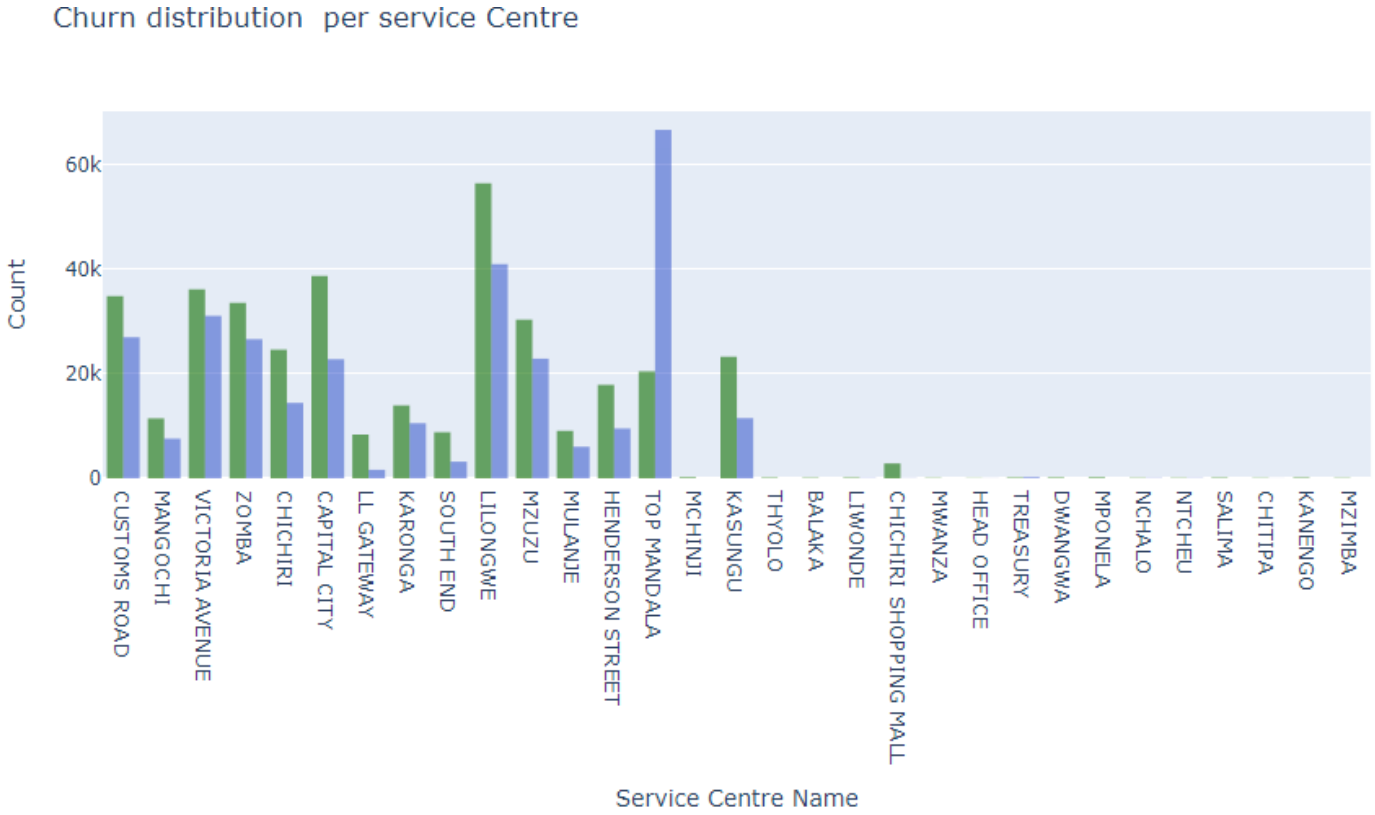


The largest number of customers are short lived (less than 5 Years) and customers who stay with the Bank for over 5 years are less likely to quit. It is surprising to see high churn in customers who are less than one year. NBM rarely diactivate customers that are less than one year old. We need to explore what kind of customers could these be.





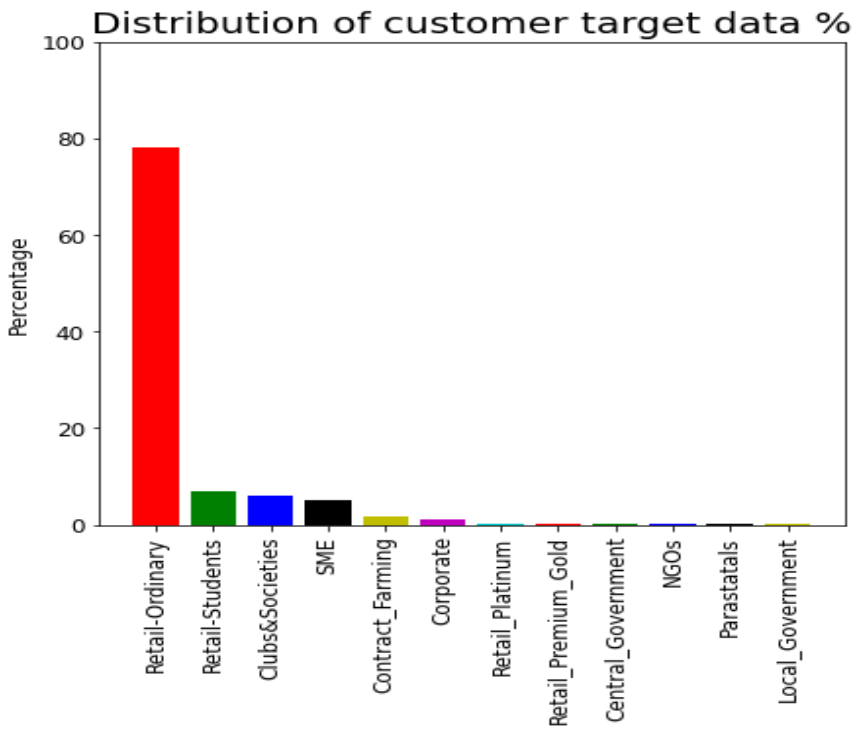
There is high churn rate in the southern region, the number of customers that churned in this region is almost the same as the number of customers retained. Central region has the lowest churn rate, we need to explore further.

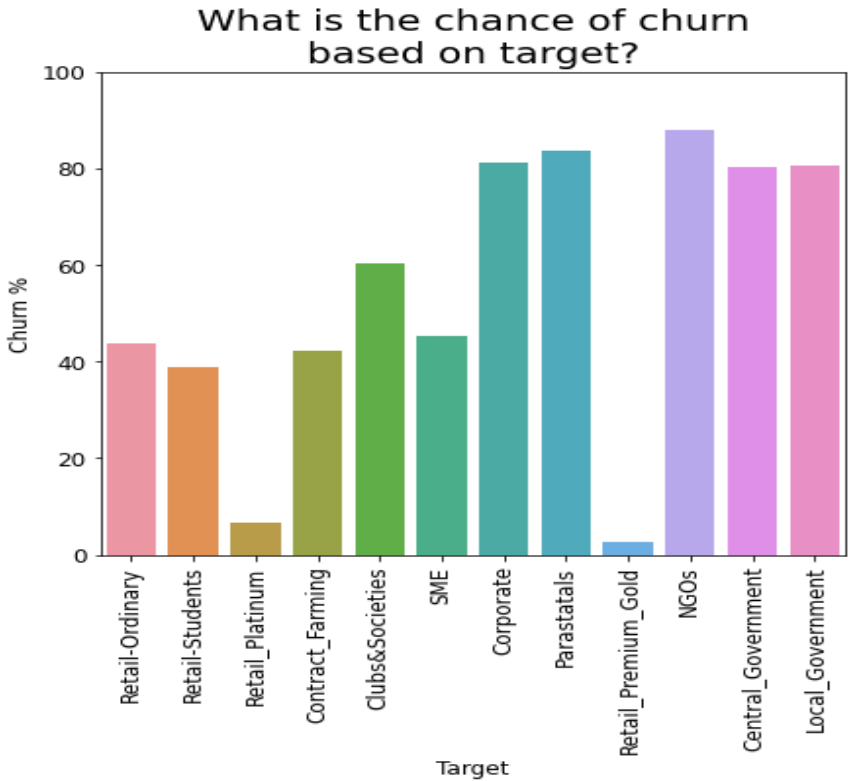


Top Mandala Service Centre has the highest churn.

NBM acquired INDE Bank in 2016 and all customers acquired from INDE Bank were domiciled in Top Mandala Service Centre. The high churn in Top Mandala tells that the largest number of customers acquired from INDE Bank churned and most of them churned within a year.

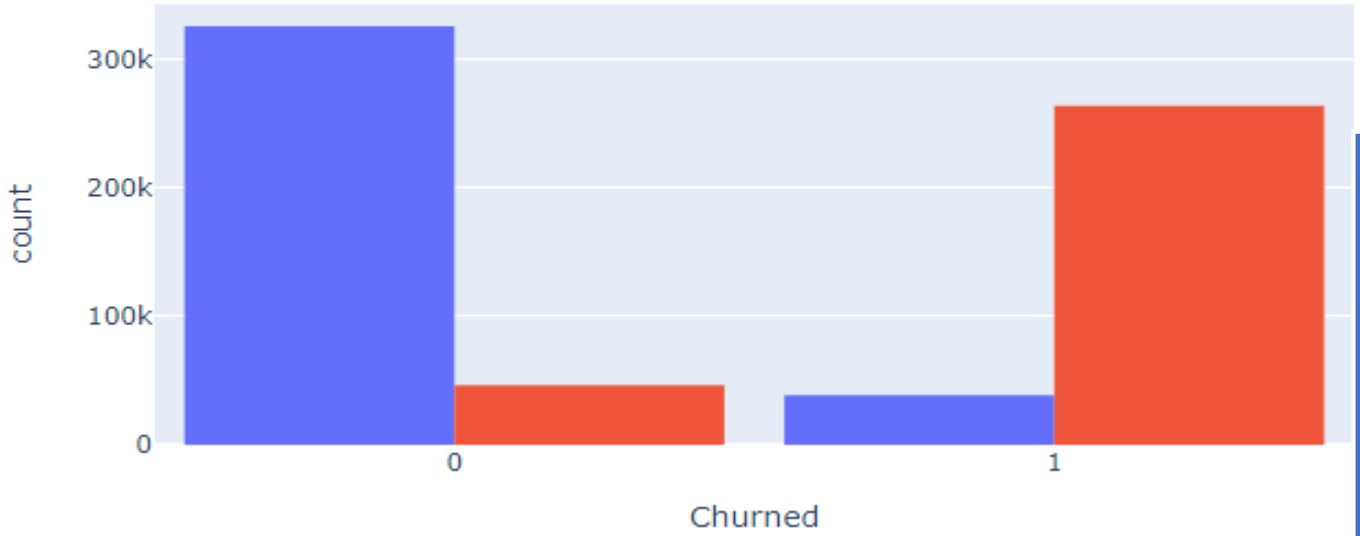
79% of customers are retail ordinary and churn is 42% in this customer group. The lowest number of customers are non individual (Corporate, parastatsla, Government & NGOs) where churn is way high than retention.





There is high churn in customers with no access to e Services

ACCESS TO E-SERVICES		
	Have access	Have no access
Churned	38,659	264,327
Retained	326,266	46,403
Total	364,925	310,730
Retained%	**89.4%**	**14.9%**



89.4% of customers with access to E Services were retained. That is 10.6% churn rate in those with access to e Services.

14.9% of those with no access were retained and 85.1% churned.

3.1 Key observations

Age

Age of the customer is one of big determinant of churn.

Age 22 and 36 have high churn rate and need to be given some special attention.

Access to E Services

Access to e Services is another big determinant of churn.

Customers who access e services churn less than those that do not have access.

Tenure

The largest number of customers are less than 5 Years (More customers churn in the first few years)

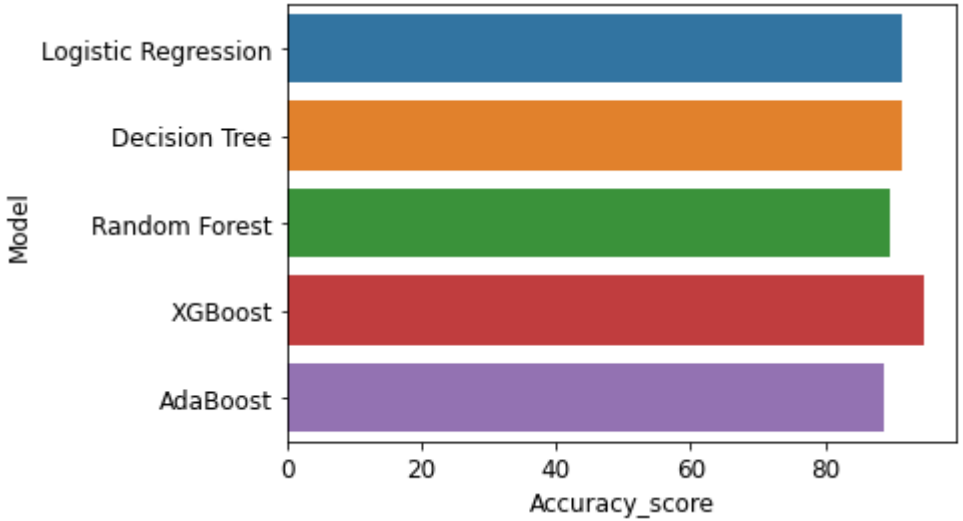
Customers that stay up to 5 years are royal and churn less

4.0 MODEL BUILDING AND EVALUATION

The following Algorithms were used in building our model:

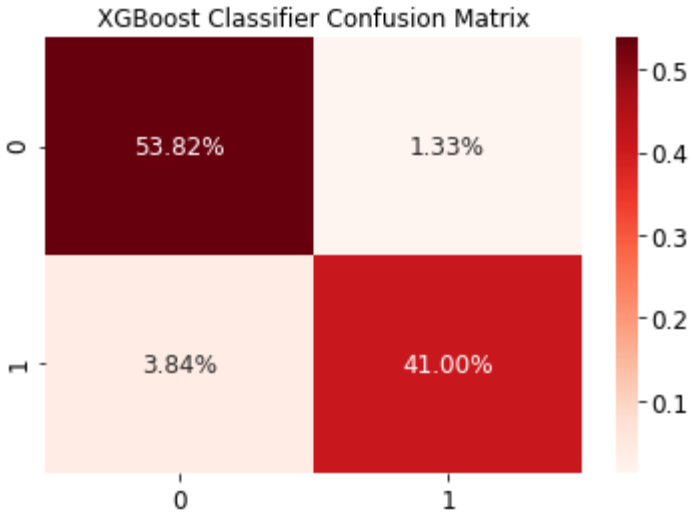
1. **Logistics Regression** which gave us **91.57%** accurate results
2. **Decision Tree Classifier:** produced 91.43% accurate results
3. **Random Forest:** Gave us **89.7%** accuracy
4. **XGBoost Classifier:** Resulted in **94.83%** accurate results
5. **AdaBoost Classifier: produced 88.67%** accurate results

4.1 Model selection



We see that **XGBoost** Classifier is the most accurate model as such this is the best model recommended for the NBM customers churn analysis project.

4.1 Reviewing the selected model



The confusion matrix says, there are 53.82% +1.33% =55.15% actual non-churn customers. The algorithm predict 53.82% as non-churn and 1.33% as churn. This is not bad.

On the other side, it says there are 41.00% +3.84 =44.84 actual churn. The algorithm predicts 41.00% as churn and 3.84% as non-churn. This is not bad, we can trust this model.

5.0 LIMITATIONS

National Bank of Malawi migrated from Branch Master to T24R9 in 2009 and upgraded to T24R15 in 2017. When migrating to T24R9, only active customers were migrated and when upgrading to T24R15 only active customers were migrated as well. The data used in this study was extracted from T24R15 database. This means that we have not considered all customers that churned in Branch Master and T24R9.

Secondly, there are some important features that we should have included in our study such as value of credits and debits throughout the tenure, and number and value of loans but time was not on our side. We should also have included district of origin, annual salary/income and number of dependents but most of these fields have blank records.

CONCLUSION

Number of active customers in NBM reached three hundred thousand some more years ago but hitting the four hundreds remain a challenge. Customer churn, which is definitely bad to profitability, is the key factor affecting growth of NBM customer base.

The best way to avoid customer churn is for a company to truly know its customers. This include identifying customers who are at risk of churning and work hard to improve their satisfaction. Using this model, NBM will easily be able to identify customers who are at risk of churning. The Bank will then focus on building customer loyalty through relevant experiences and specialized service to stop these customers from churning.