CUSTOMER CHURN PREDICTION IN THE TELECOM INDUSTRY

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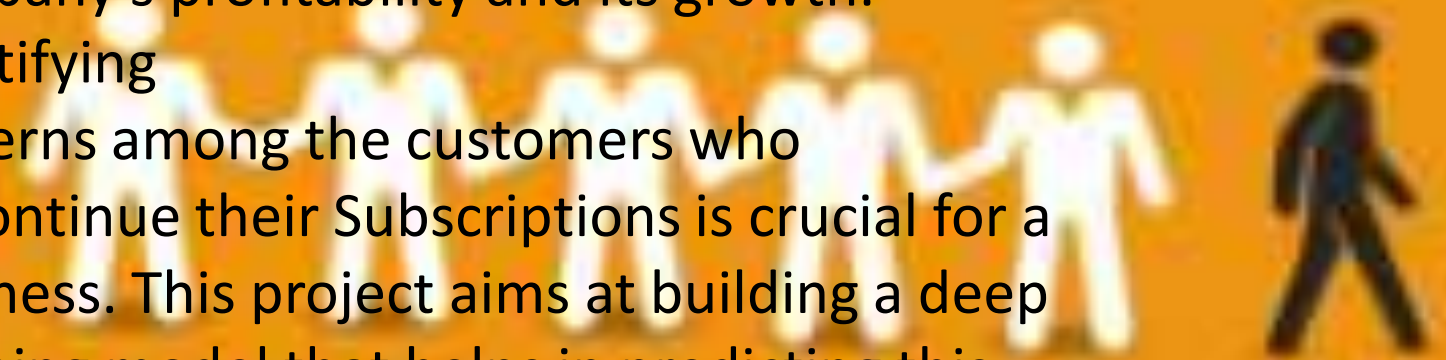
STATEMENT OF THE PROBLEM:

Churn rate is a metric that gives the total percentage of customers who discontinue their subscriptions within a particular period.

A high churn rate could potentially affect a company's profitability and its growth.

Identifying patterns among the customers who discontinue their Subscriptions is crucial for a business. This project aims at building a deep learning model that helps in predicting this occurrence .

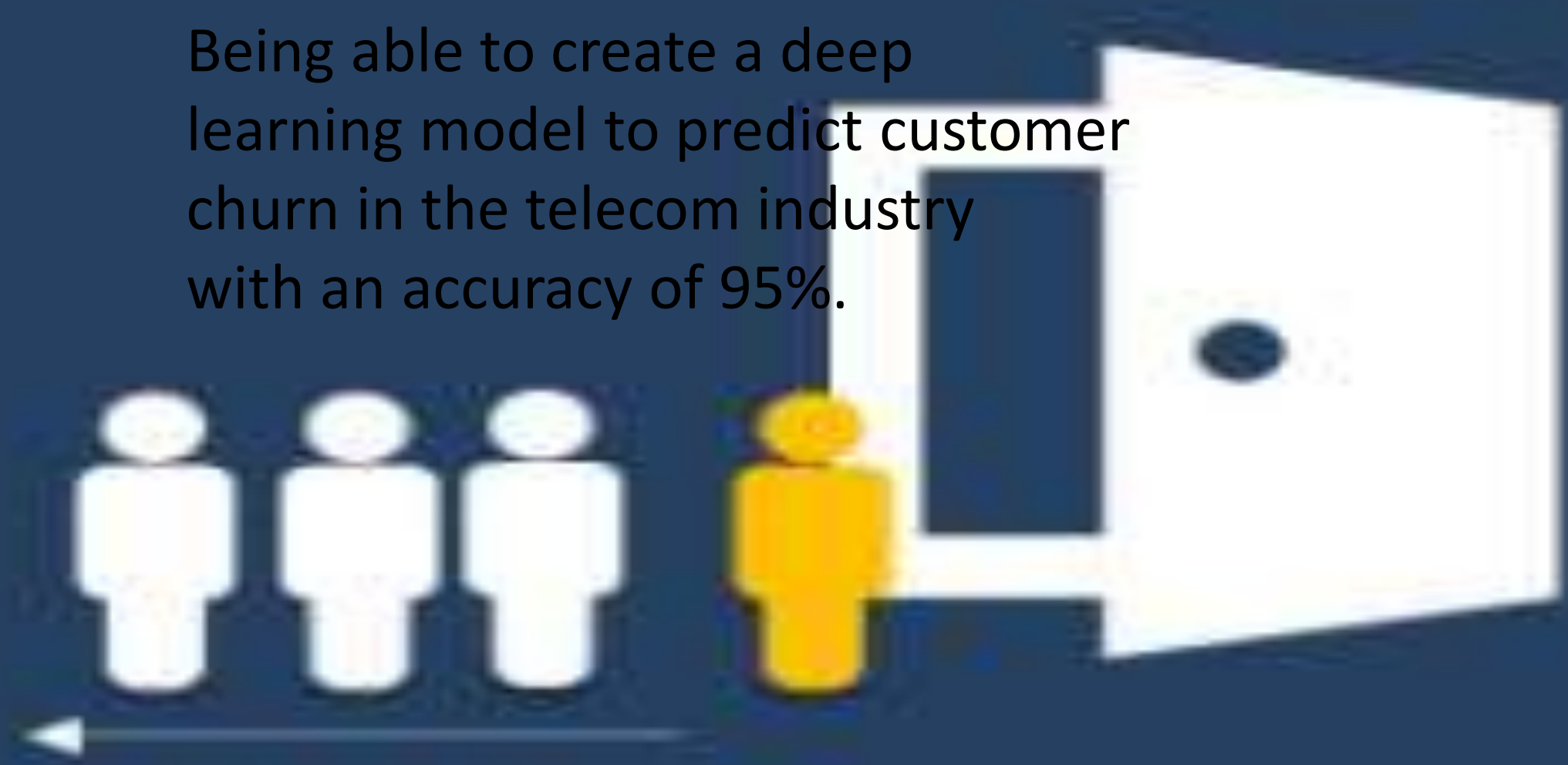


Main Objective

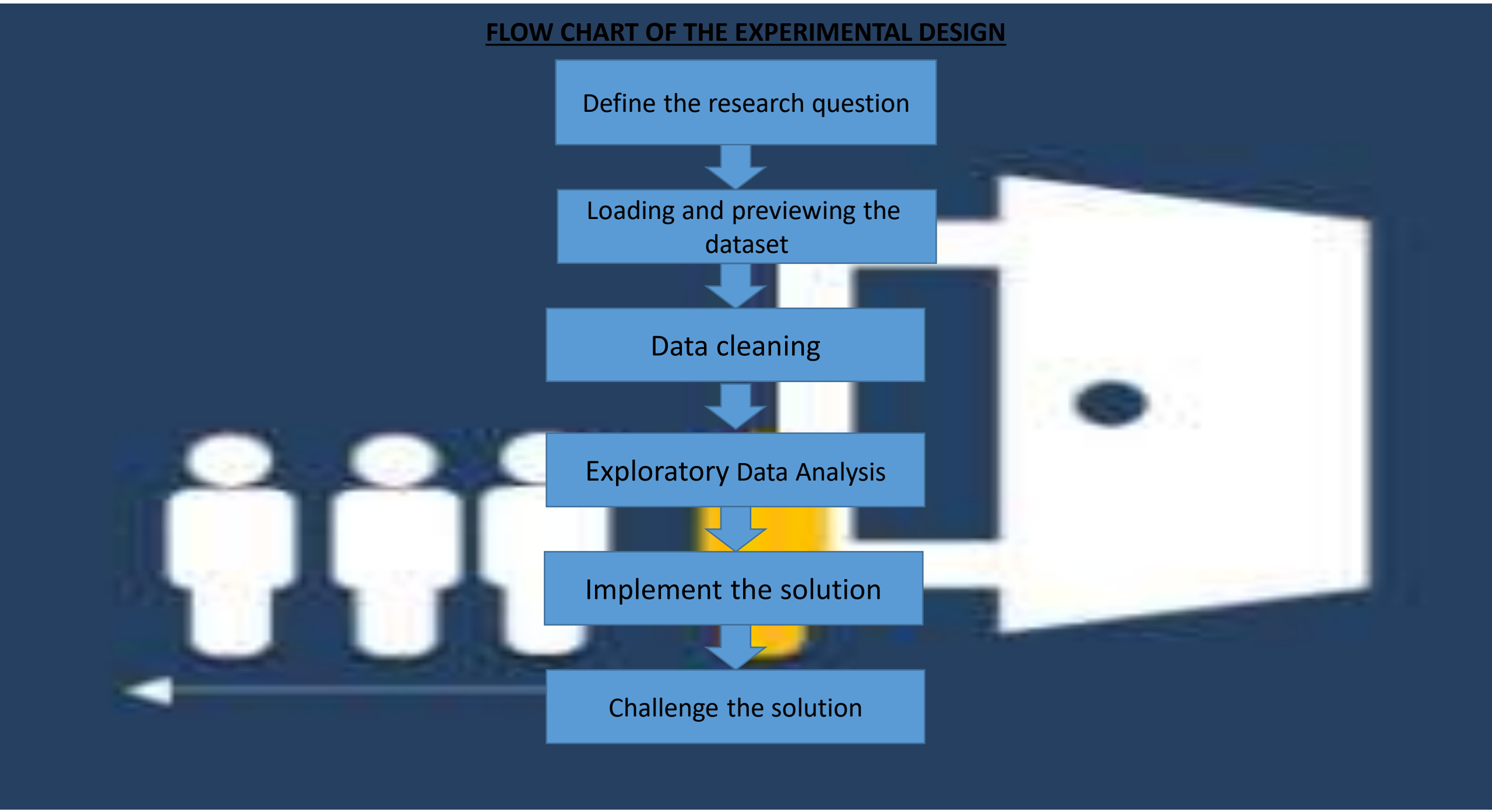
Create an artificial neural network model that predicts customer churn rate.

Metric for success

Being able to create a deep learning model to predict customer churn in the telecom industry with an accuracy of 95%.



FLOW CHART OF THE EXPERIMENTAL DESIGN



UNDERSTANDING THE VARIABLES/COLUMNS

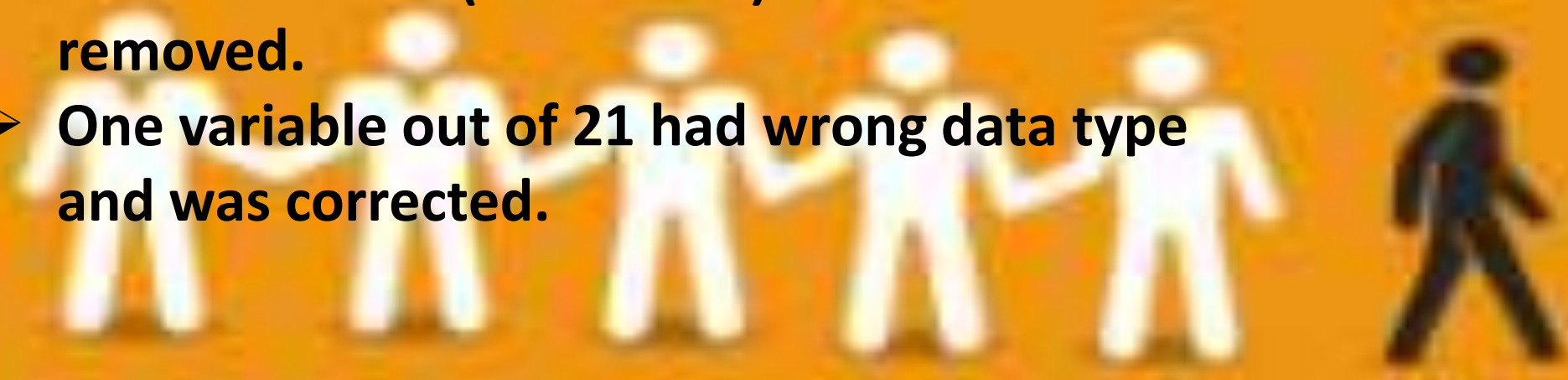
- **Customers who left within the last month**-the column is called Churn
- **Services that each customer has signed up for**-phone, multiple lines, internet, online security, online backup, device protection, tech support, and streaming TV and movies
- **Customer account information**- how long they've been a customer, contract, payment method, paperless billing, monthly charges, and total charges
- **Demographic info about customers** – gender, age range, and if they have partners and dependents

Overview of the data

- The dataset has 7043 rows and 21 columns.
- There are no outliers and duplicates in the data.

Data Cleaning

- The null values (blank cells) were 11 and were removed.
- One variable out of 21 had wrong data type and was corrected.



EXPLORATORY DATA ANALYSIS

1.Univariate

This involves analyzing a single variable at ago. The following are the insights drawn from some of the analysis performed.

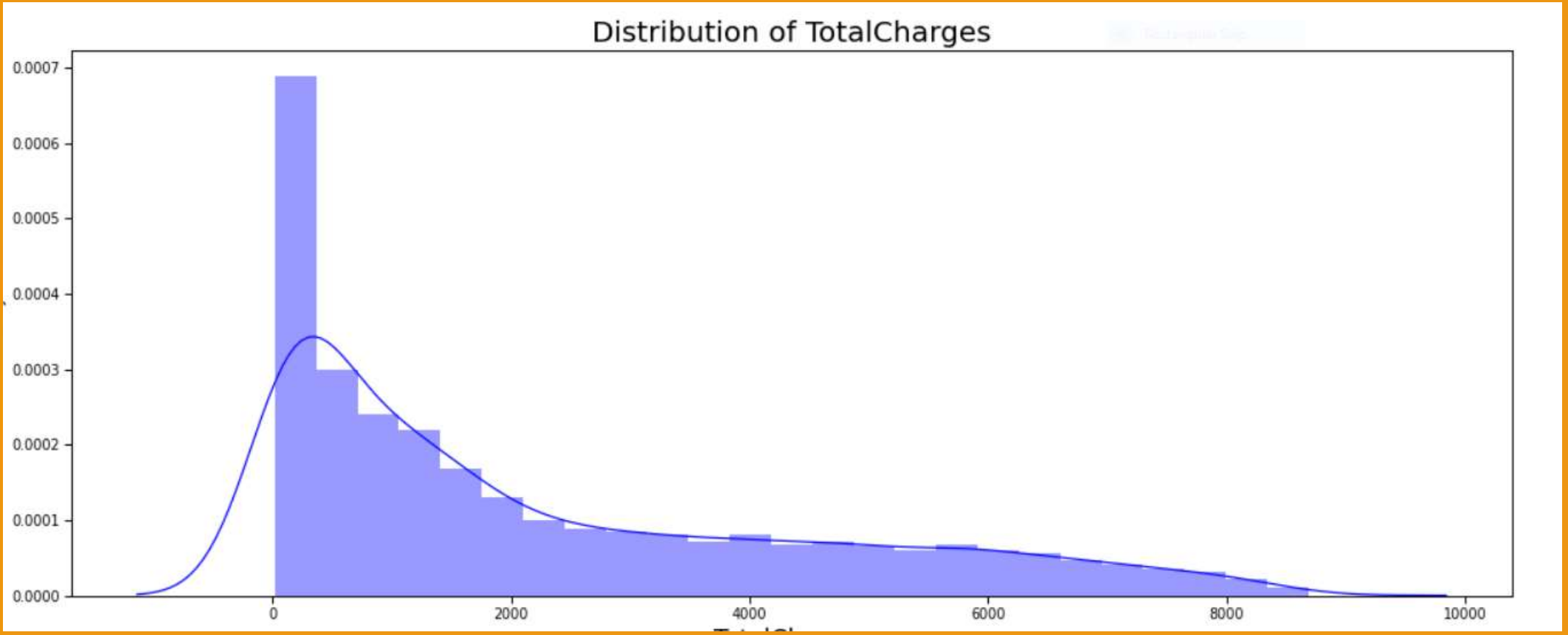
a)Target Variable(Churn)

```
# Ratio of our target variable
df1['Churn'].value_counts()/len(df1['Churn'])*100
```

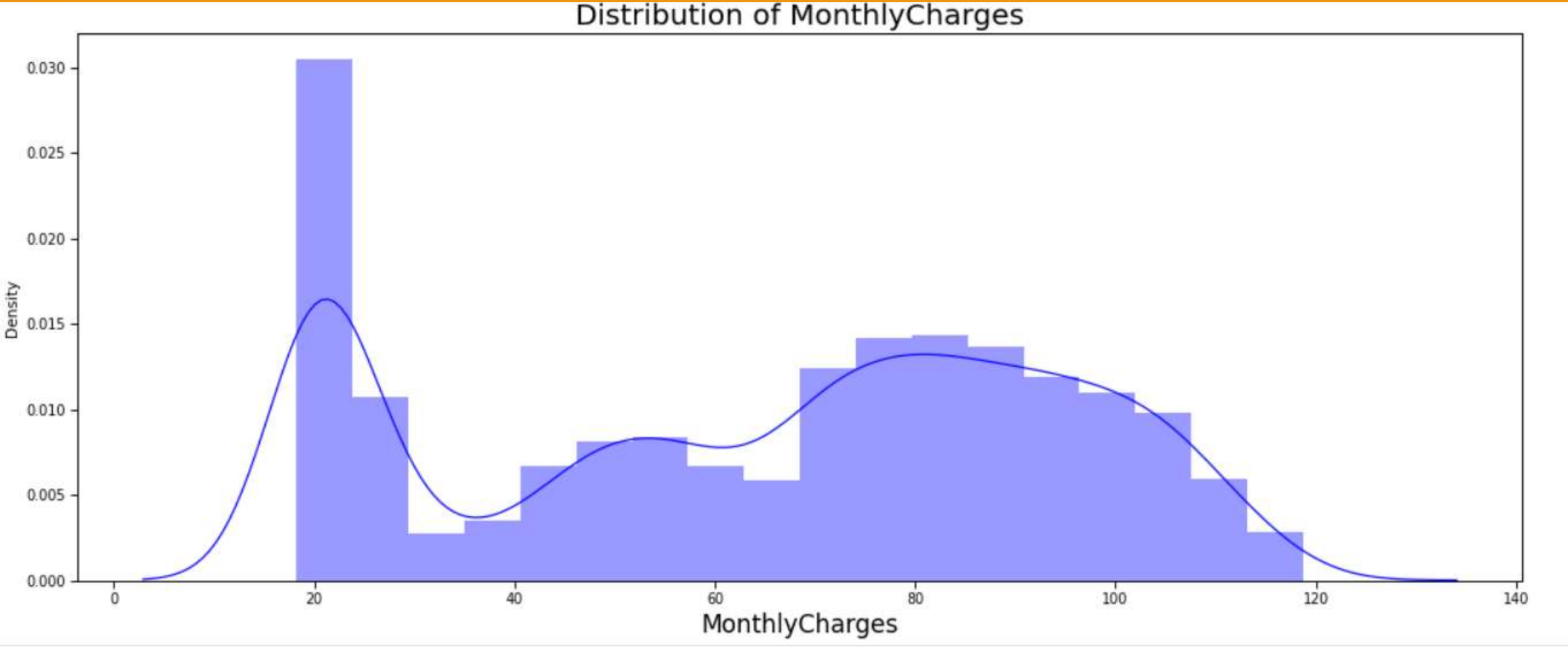
```
No     73.421502
Yes    26.578498
```

A high class imbalance was observed in the target variable.

b)Distribution of total charges
It was observed that the total charges were skewed to the right meaning the numbers tend to lie more to high values.

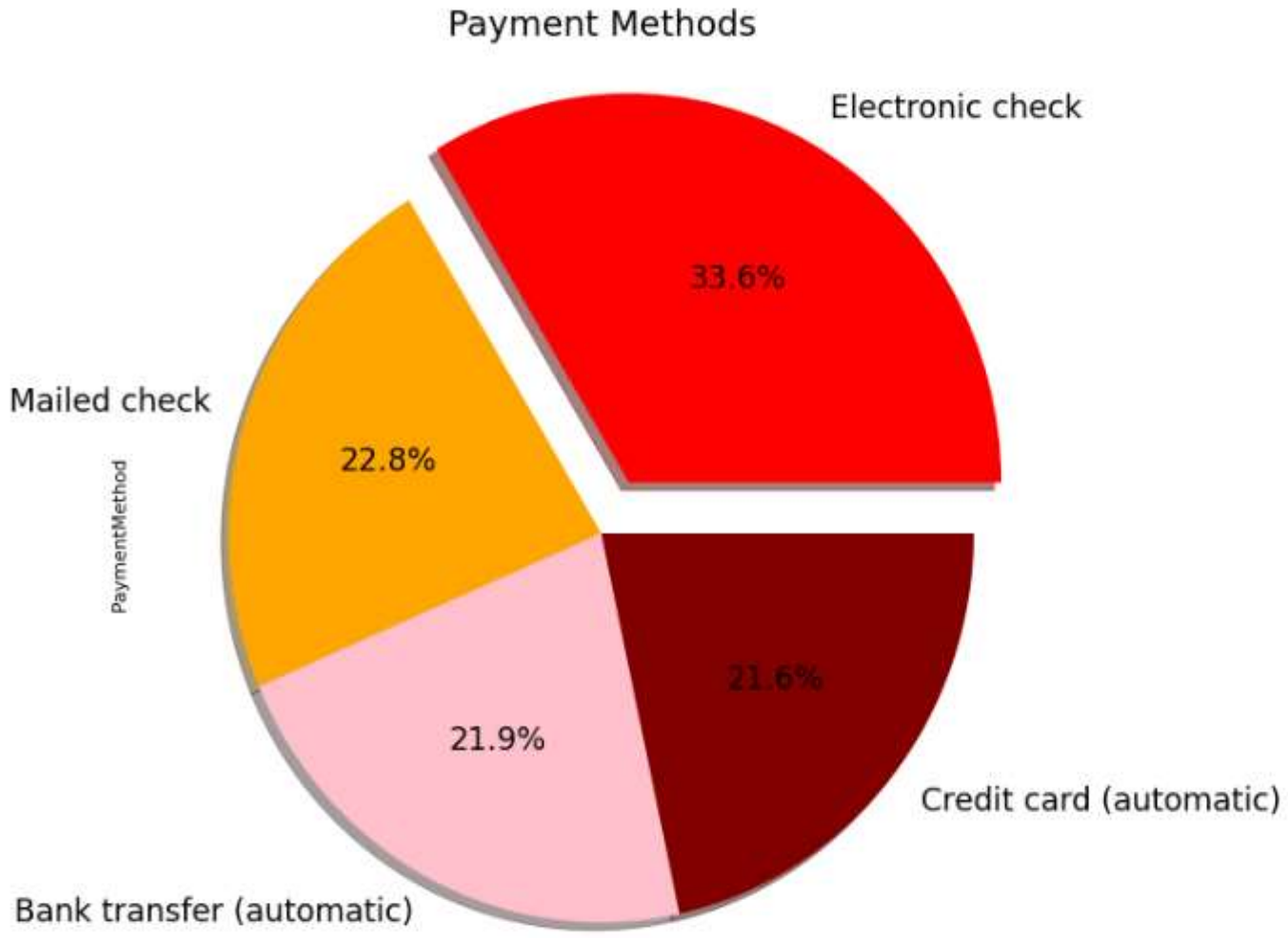


c)Distribution of Monthly charges
The numbers tend to lie towards high values showing
a positively skewed distribution



d) Pie chart showing payment methods

- Most customers are likely to use Electronic checks as a mode of payment.

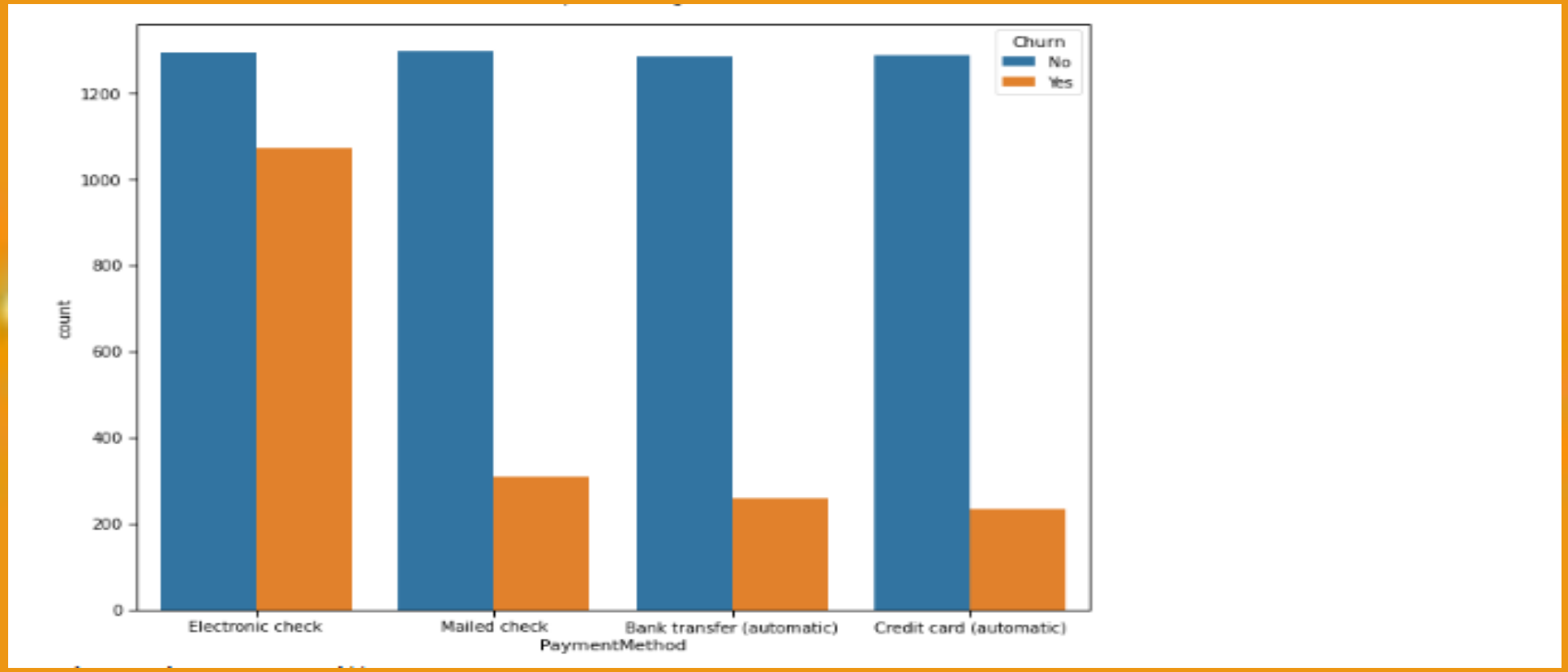


2.Bivariate Analysis

This involves analyzing two variables. Here, each variable was plotted in relation to the churn using bar graphs.

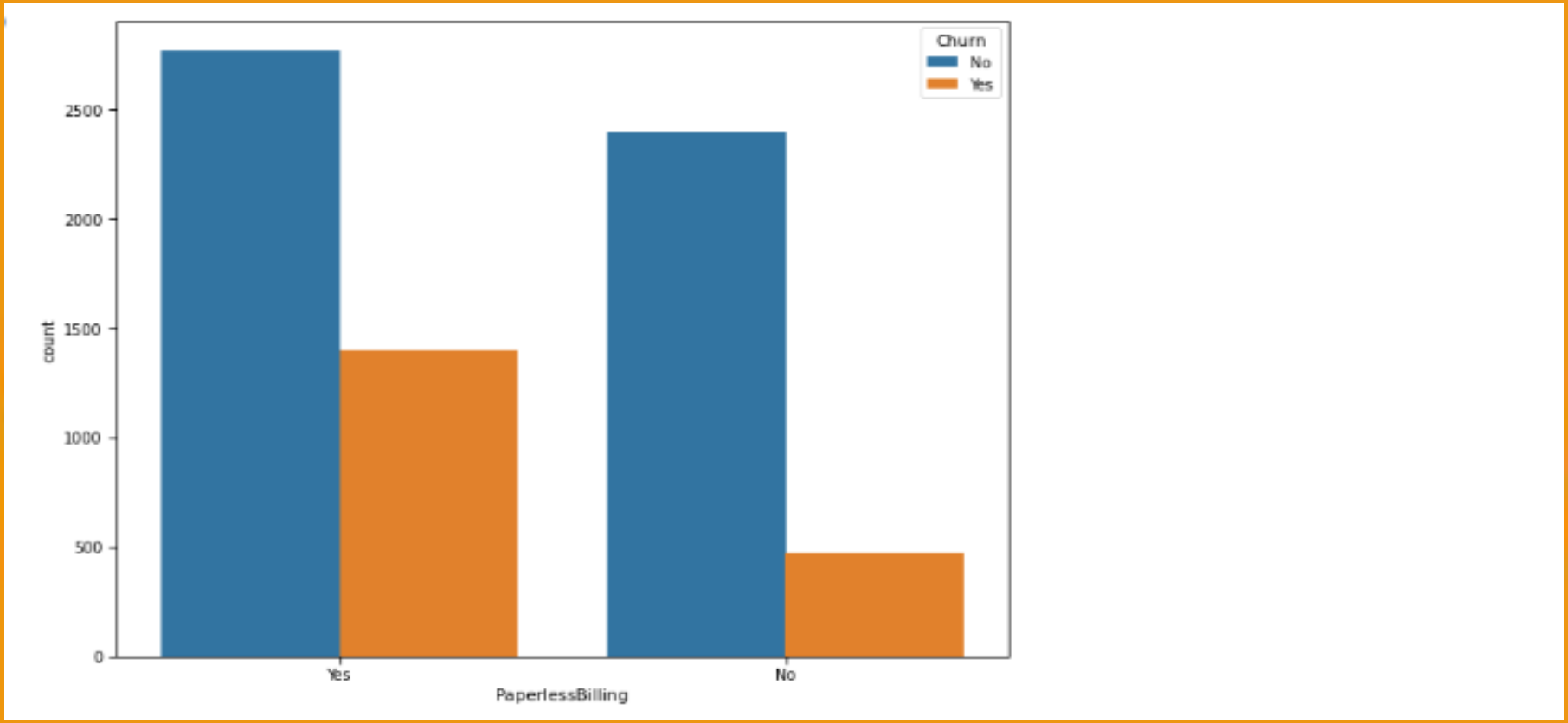
a)Payment method in relation to churn

Churn rate among those customers using Electronic checks as a payment method is higher.



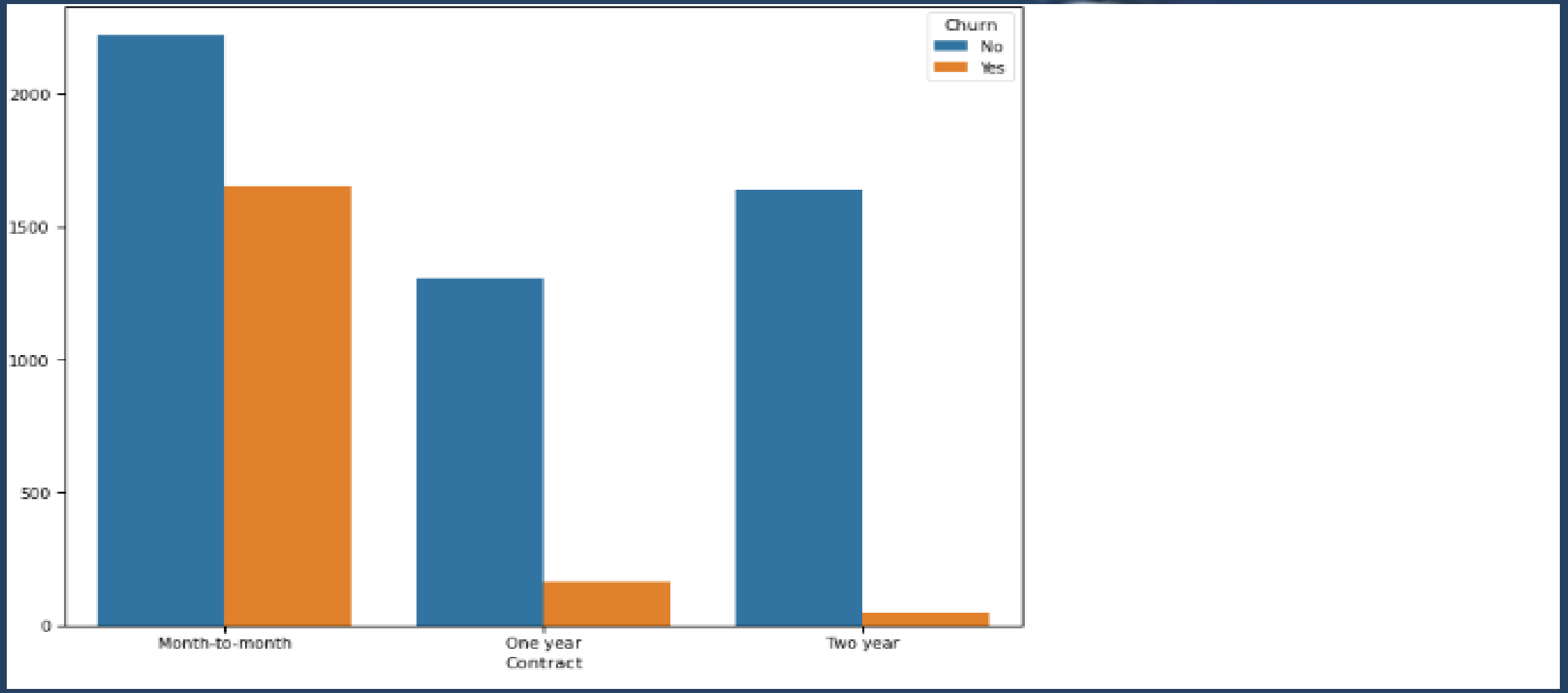
b)Paperless Billing

Customers who use paperless billing tend to churn more than those using paper billing.

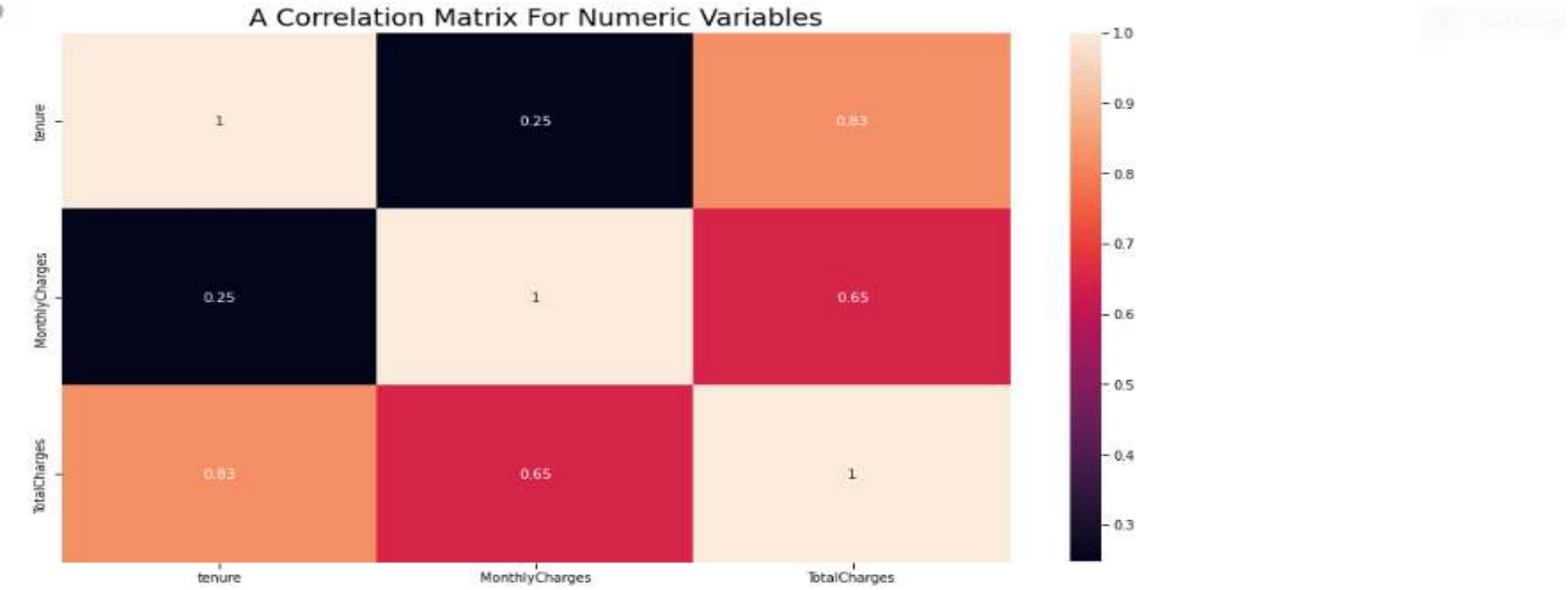


c) Contract

Customers with monthly subscription tend to churn more as compared those with 1-2 year contract.



d) Heatmap showing correlation of numerical variables



servations

- There is a strong positive correlation between Total Charges and Tenure.The longer a customer stays the more they pay.
- There is a weak positive correlation between tenure and Monthly charges.

IMPLEMENTING THE SOLUTION

- This included creating the neural network using tensorflow and keras which would predict the customer churn in the telecom industry.
- The accuracy obtained was 79.17%

CHALLENGING THE SOLUTION

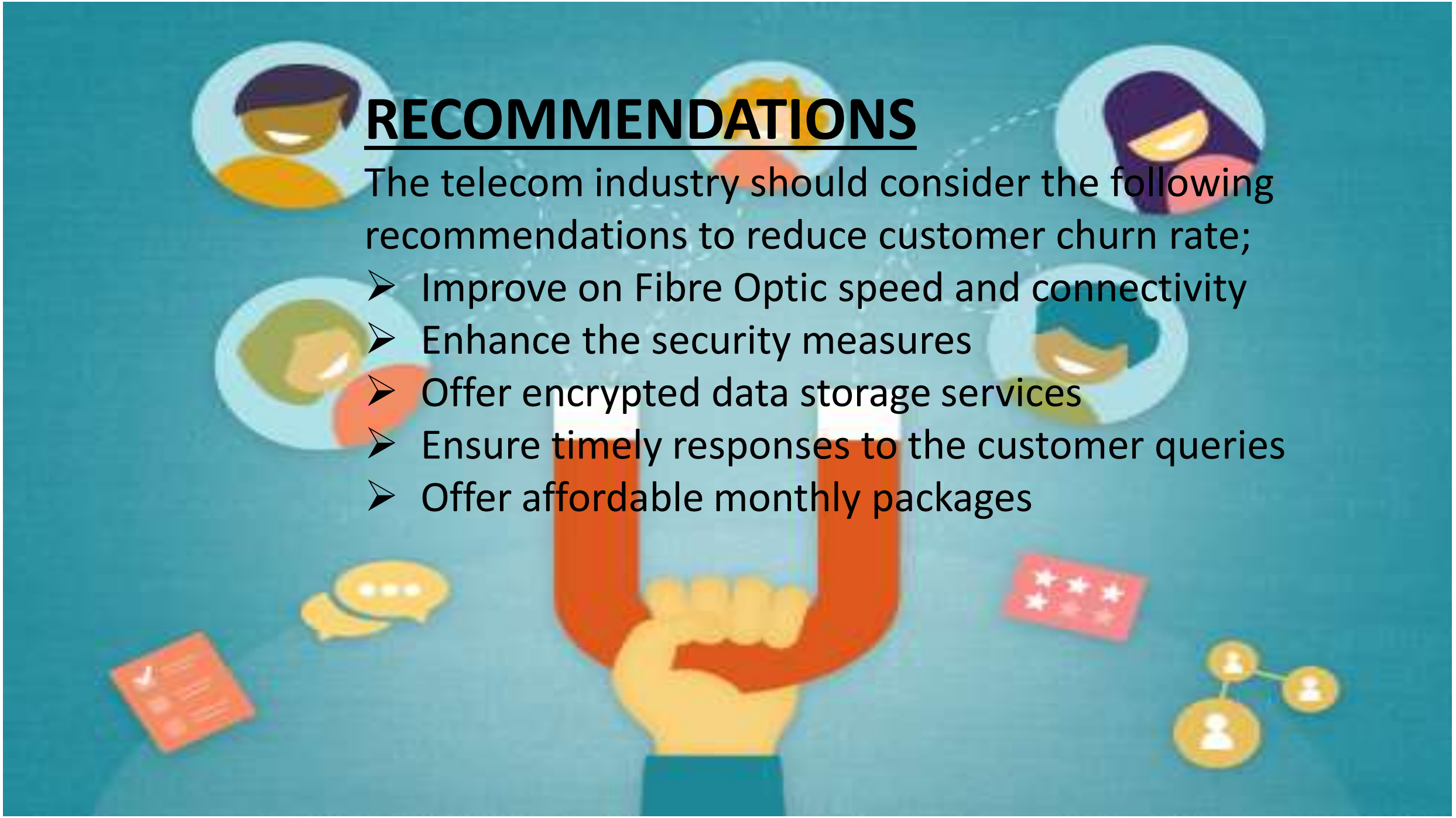
The solution was challenged by:

- Using another Optimizer which gave an accuracy of 79.56%
- Using a Machine learning model(XGBoost) which gave an accuracy of 81%

CONCLUSION

From the EDA performed, it was concluded that;

- Churn rate is high in customers who use Fibre Optic compared to those who use DSL and those without any internet service.
- Customers having no online security tend to have a higher churn rate.
- Customers without online backup services are likely to churn.
- Customers are likely to churn where there is no Tech Support.
- Customers with monthly subscription tend to churn more as compared those with 1-2 year contract.
- Customers who use paperless billing tend to churn more than those using paper billing.



RECOMMENDATIONS

The telecom industry should consider the following recommendations to reduce customer churn rate;

- Improve on Fibre Optic speed and connectivity
- Enhance the security measures
- Offer encrypted data storage services
- Ensure timely responses to the customer queries
- Offer affordable monthly packages


THANK YOU!!!!!!