TELECOM CUSTOMER CHURN PREDICTION

POWERED BY AWS SAGEMAKER

Submitted by:

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1. INTRODUCTION

a. OVERVIEW

Customer churn is a major problem and one of the most important concerns for large companies. Telecommunication industry always suffers from very high churn rates when one industry offers a better plan than the previous there is a high possibility of the customer churning from the present due to a better plan in such a scenario it is very difficult to avoid losses but through prediction, we can keep it to a minimal level. Due to the direct effect on the revenues of the companies, companies are seeking to develop means to predict potential customers to churn. Therefore, finding factors that increase customer churn is important to take necessary actions to reduce it.

b. PURPOSE

The ability to predict that a particular customer is at a high risk of churning, while there is still time to do something about it, represents a huge additional potential revenue source for every online business. Besides the direct loss of revenue that results from a customer abandoning the business, the costs of initially acquiring that customer may not have already been covered by the customer's spending to date. (In other words, acquiring that customer may have actually been a losing investment.) Furthermore, it is always more difficult and expensive to acquire a new customer than it is to retain a current paying customer.

2. LITERATURE SURVEY

a. EXISTING PROBLEM

Churn prediction modeling techniques attempt to understand the precise customer behaviors and attributes which signal the risk and timing of customer churn. The accuracy of the technique used is obviously critical to the success of any proactive retention efforts. After all, if the marketer is unaware of a customer about to churn, no action will be taken for that customer. Additionally, special retention-focused offers or incentives may be inadvertently provided to happy, active customers, resulting in reduced revenues for no good reason. Therefore, customer retention, is generally more cost-effective as you've already earned the trust and loyalty of existing customers. Customer churn impedes growth,

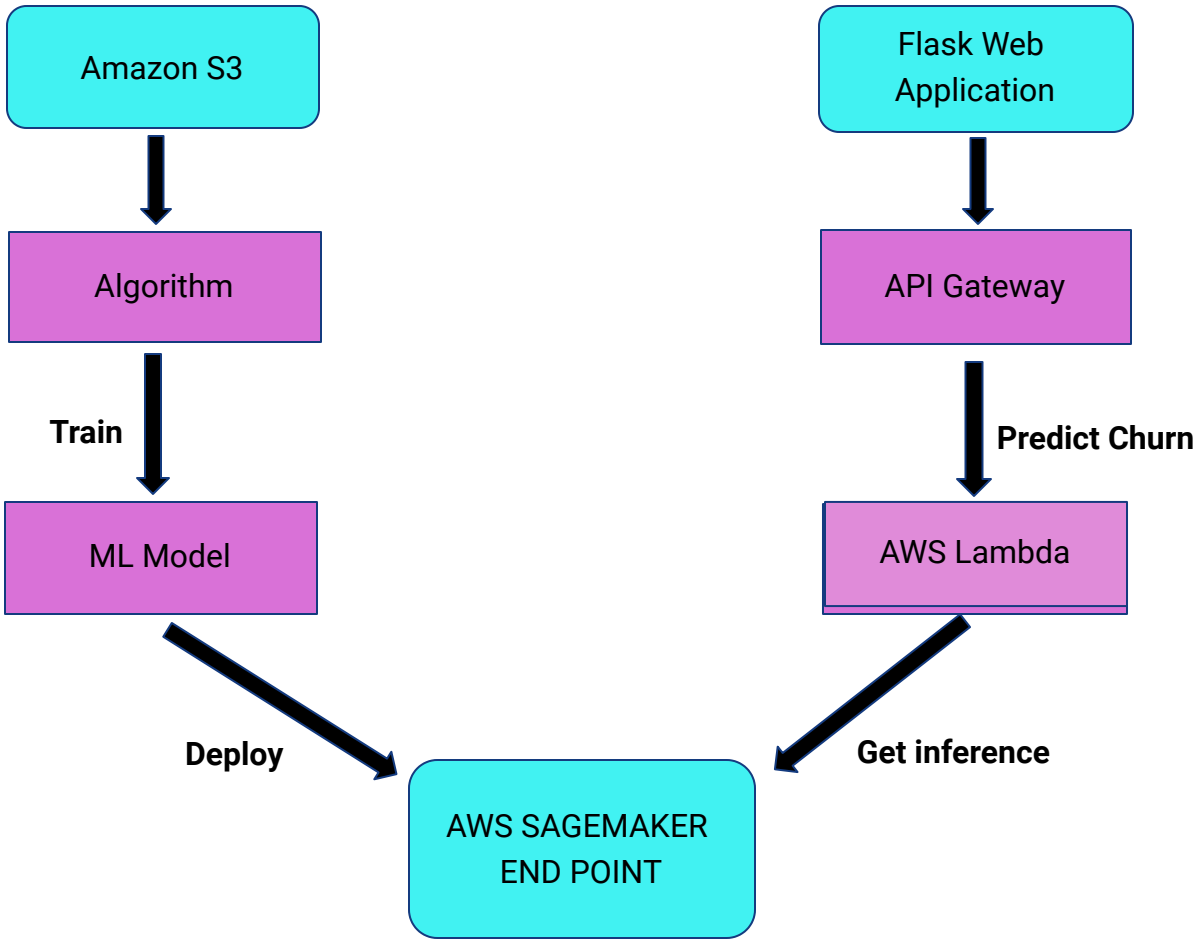
so companies should have a defined method for calculating customer churn in a given period of time. By being aware of and monitoring churn rate, organizations are equipped to determine their customer retention success rates and identify strategies for improvement.

b. PROPOSED SOLUTION

Churn prediction helps in identifying those customers who are likely to leave a company. The main contribution of our work is to develop a churn prediction model which assists telecom operators to predict customers who are most likely subject to churn. Our solution builds & deploys a Machine Learning model to predict the customer churn using Amazon SageMaker and predictions can be obtained by using its Endpoint. We have created a python - flask application that interacts with the model deployed on AWS Sagemaker with the help of AWS API Gateway and AWS Lambda Services.

3. THEORETICAL ANALYSIS

a. BLOCK DIAGRAM



b. HARDWARE/SOFTWARE DESIGNING

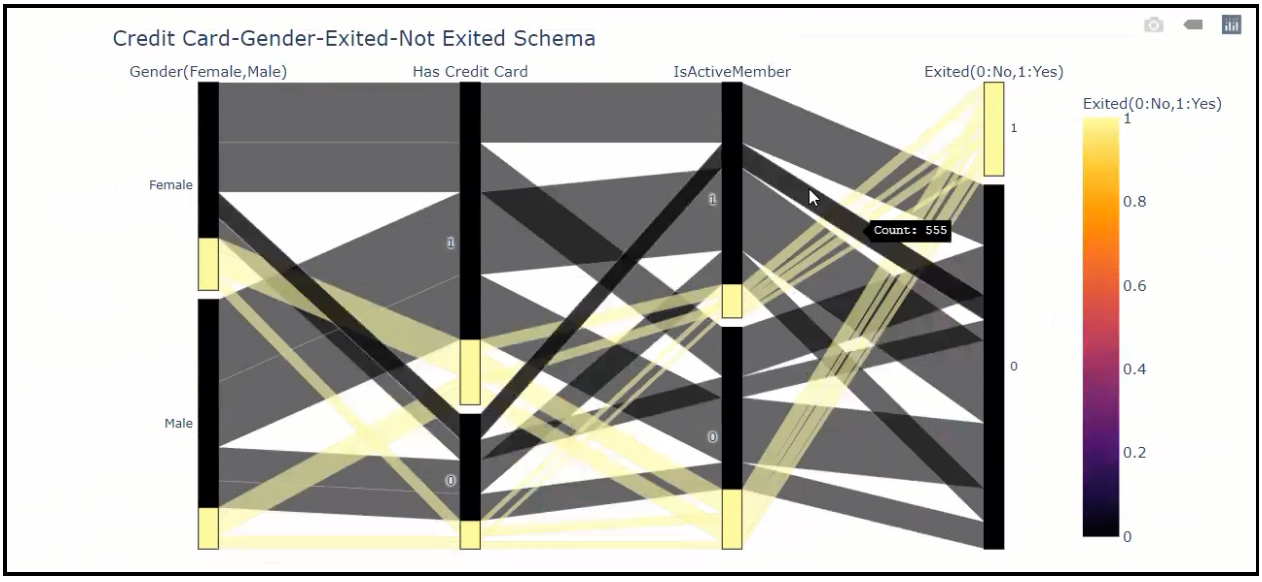
i. Upload data on Amazon S3
ii. Model deployment on Amazon Sagemaker
iii. Configuration on AWS Lamda
iv. Working with Rest API through AWS API Gateway
v. Web Application in Flask
vi. Language used: Python

4. EXPERIMENTAL INVESTIGATIONS

The accuracy of the model was found out to be 0.76 which is 76%.

Calculating the accuracy of the model

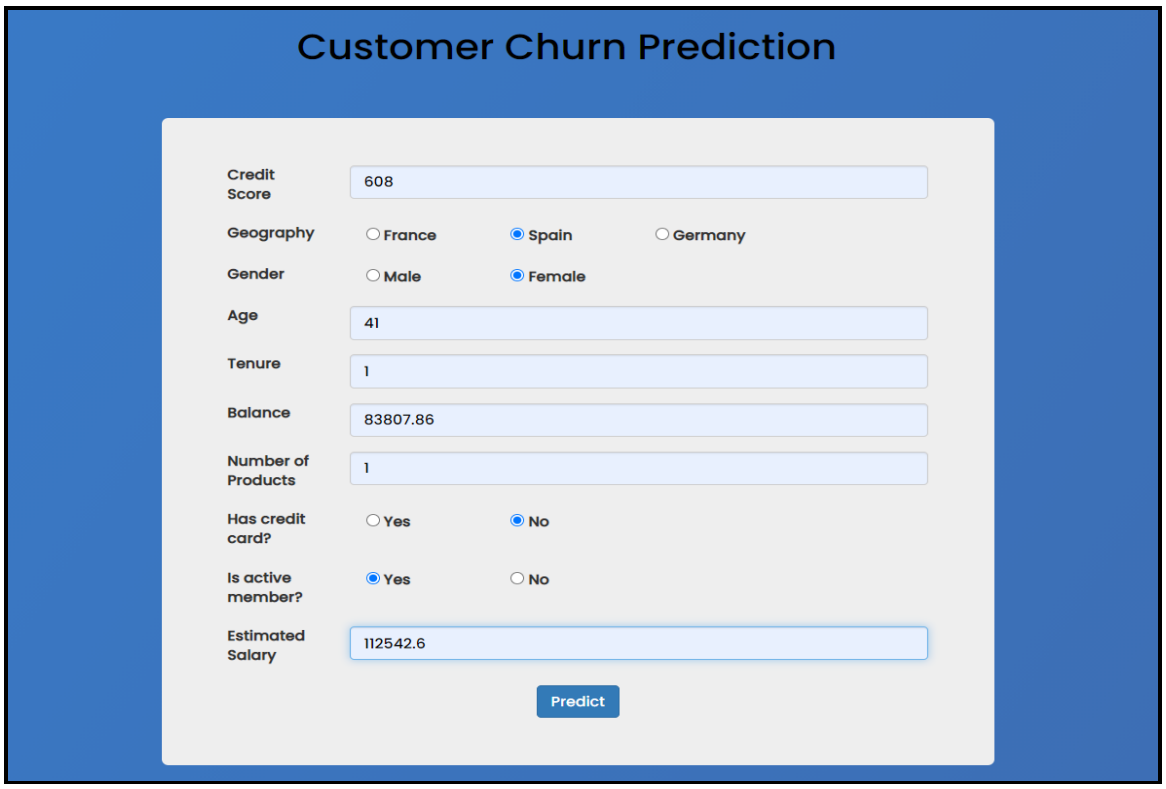
```
In [46]: from sklearn.metrics import precision_score
         precision = precision_score(test.iloc[:,0], pred_label)
         print(precision)

         0.7619047619047619

In [47]: from sklearn.metrics import confusion_matrix
         confusion_matrix(test.iloc[:,0],pred_label)

Out[47]: array([[1525,   65],
                [ 202,  208]])
```

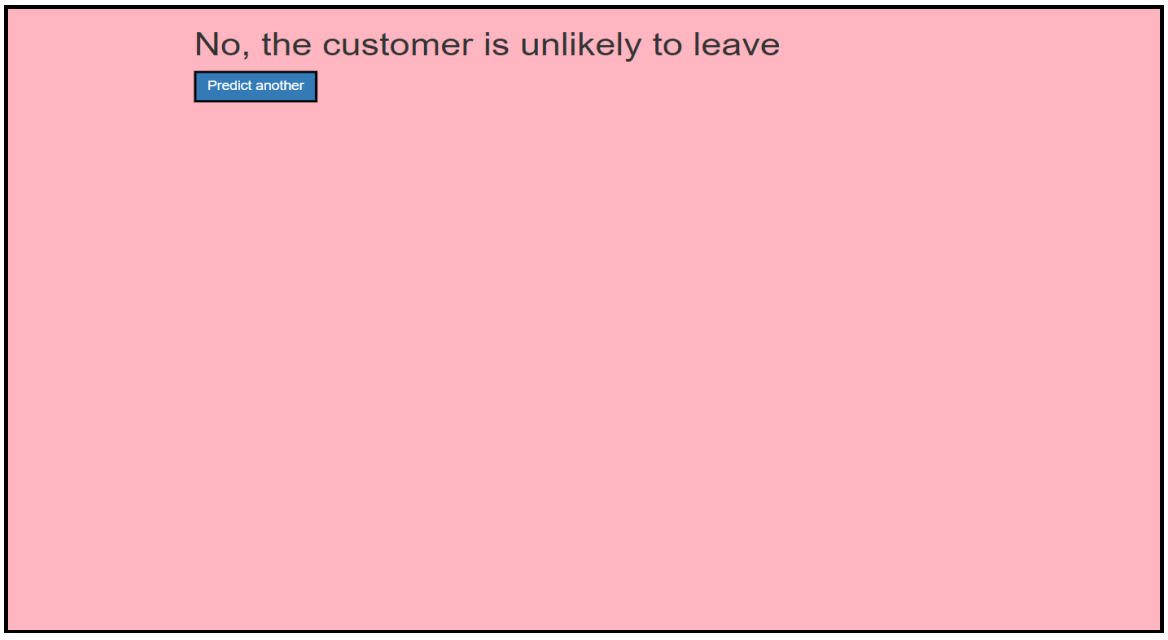


5. RESULT

THE UI:

The result is a Flask web application to which data is given for prediction of costumer churn.





6. ADVANTAGES AND DISADVANTAGES

a. ADVANTAGES:

i. **Gain information for improvement:** Dissatisfied customers are a source of constructive feedback for an organization's betterment. An organization will gain information about aspects which need to be improved while implementing strategies to prevent customer churn.

ii. **Reduce the risk of business:** Customer churn indicates a direct loss to the business. Selling a new product/service to an existing customer will be much easier than selling it to a new customer. Thus, customer churn can be harmful to the growth of the business.

iii. **Understand the target market:** Constantly working towards the reduction of customer churn will uncover layers of the market which were otherwise unknown. Surveys focus groups and other such activities can be carried out to know the target market in a better manner and in turn reduce customer churn.

iv. **Build a competitive advantage in the market:** In a world where the there is a constant competition to attain new customers and retain existing ones, having an edge over competition is important. In the process of reducing customer churn, not only do customers know unknown aspects of a business but also build a competitive advantage over the others in the market.

b. DISADVANTAGES:

i. **Increase Vulnerability to Information Hacking and Attacks** - With sensitive data being transmitted and shared over the Internet and other networks, there's a possibility people will try to hack it either for their own pleasure or for use by the competition. Communication through video conferences, teleconferences and video calls, unsafe and costly to a larger extent.

ii. **Misleading data** - Sometimes wrong information may influence the results and mislead the data.

7. APPLICATIONS

a. Helps a company retain its costumers and increase revenue
b. Predicting churn rates can also help your business identify and improve upon areas where customer service is lacking
c. Churn Prediction help to identify the possible churners in advance before they leave the network. So required retention policies can be made to attract the likely churners and to retain them.

8. CONCLUSION

The project takes up the challenge of predicting churn rates and successfully prepares a model for it. A Flask application is made inorder to interact with the model. It was a wonderful learning experience to work in this project. This project took me through the various phases of project development and gave me real insight into the world of software engineering. The joy of working and the thrill involved while tackling the various problems and challenges gave me a feel of the developers' industry.

It was due to this project I came to know how professional software is designed.

9. FUTURE SCOPE

An intelligent predictive churn analytics model, powered by Big Data analytics will allow businesses to process, analyse, and co-relate traditional and non-traditional metrics to achieve a holistic customer blueprint and effective insights that can trigger an alarm way before real damage is done.

10. BIBLIOGRAPHY

- **https://www.google.com**
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- **https://www.youtube.com/**