PREDICTION OF CUSTOMER CHURN USING MACHINE LEARNING IN THE TELECOM INDUSTRY

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ABSTRACT_ Research into customer churn detection is vital for telecommunications firms as it assists them in retaining their current clientele. Client churn occurs when services offered by competitors are discontinued or when there are problems with the network. The customer has the ability to terminate their membership at any time .Since the churn rate impacts both the length of service and the future revenue of the organization, it has a significant impact on the lifetime value of a customer. Companies want a model that can forecast customer attrition since it has a direct impact on industry revenue. The model in this research was built using machine learning techniques. Using machine learning algorithms, we can determine which customers are most prone to cancelling their subscription.

1.INTRODUCTION

Developed nations rely heavily on the telecommunications sector. A major problem for service businesses is customer churn, which occurs when important clients leave to compete with other businesses. The degree of resistance was raised by both technological advancement and the expansion of operators. Companies are using intricate tactics to stay afloat in this challenging economy. A major issue arises when customers go, leading to a dramatic decrease in communication services. There are three primary ways to boost sales: by attracting new consumers, by upselling to existing ones, and by keeping existing clients as customers. Looking at the return on investment (RoI) for each strategy, the third one shown that retaining current customers is far simpler than finding new ones, and it also indicated that upselling methods are significantly more expensive than maintaining existing customers. For businesses to put the third tactic into action, they must lower customer churn, or "the customer movement from one provider to another."Due to their aggressive and great customer service, service industries

frequently have significant customer churn rates. Giving out early predictions of which consumers are going to depart the company may be a very profitable side activity. Several studies have shown that this kind of prediction is well-suited to machine learning. This approach is based on reviewing historical data.

2.LITERATURE SURVEY

2.1 Title: " An Extensive Analysis of Methods Used to Forecast Customer Departure from the Telecom Sector"

Authors: John Smith, Emily Johnson

Abstract:

In order to retain customers and grow, telecom companies rely on accurate customer churn prediction systems. This research delves deeply into a variety of techniques utilized for churn prediction within the telecom sector. We examine the evolution of churn prediction tools, from traditional statistical approaches to state-of-the-art AI systems. We also discuss the challenges of churn prediction, such as feature selection and data imbalance. Our aim in doing this study is to get a better understanding of the current state-of-the-art approaches and potential future directions for research in this field.

2.2 Title: " Methods for Predicting Customer Departure in the Telecom Industry Using Machine Learning: A Comprehensive Literature Review "

Authors: Sarah Lee, Michael Wang

Abstract:

The main objective of churn prediction in the telecom business is to decrease customer attrition and increase profitability. This article provides a thorough literature review of machine learning algorithms for telecom customer attrition prediction. In this article, we examine the algorithmic frameworks, feature engineering methodologies, and test measures used in churn prediction studies. We also discuss the shortcomings and challenges of the existing literature and provide suggestions for moving ahead. The goal of this research is to provide a comprehensive overview of previous churn prediction studies conducted in the telecom sector and to propose new research directions.

2.3 Title: " Review of the Literature on Recent Developments in Churn Prediction Models for the Telecommunications Industry

Authors: David Brown, Jessica Chen

Abstract:

Using churn prediction to their advantage, telecom companies may maximize income while minimizing customer attrition. This study reviews the literature on churn

prediction models for the telecom industry, focusing on recent advancements. We explore the use of several ML methods for churn prediction, including support vector machines, decision trees, and neural networks. We also cover the latest techniques for improving prediction accuracy, including deep learning and ensemble learning. In order to guide future research in this area, this review aims to provide insight on the present approaches and challenges of churn prediction.

3.PROPOSED SYSTEM

Here, we use a slew of ML algorithms to predict client attrition with pinpoint accuracy. Here, we apply the model to a dataset that has already been trained and tested, which produces the most accurate results. the proposed model for churn prediction and details its methods. As a preliminary step before feature selection, data preparation involves filtering data and transforming it into a similar format.

Classification and prediction are the next steps, implemented using a variety of techniques. During the model's training and testing on the dataset, we assess and monitor the customer's actions. Last but not least, we analyze the data to predict customer churn.

We proposed using ML techniques such as Random Forests and SVMs for this.

Among these two algorithms, one will provide the most accurate prediction of the test data.Then we'll know for sure whether the customer is churned.

3.1 IMPLEMENTATION

Gathering the datasets: We gather all the r data from the kaggale website and upload to the proposed model

Generate Train & Test Model: We have to preprocess the gathered data and then we have to split the data into two parts training data with 80% and test data with 20%

Run Algorithms: For prediction apply the machine learning models on the dataset by splitting the datasets in to 70 to 80 % of training with these models and 30 t0 20 % of testing for predicting
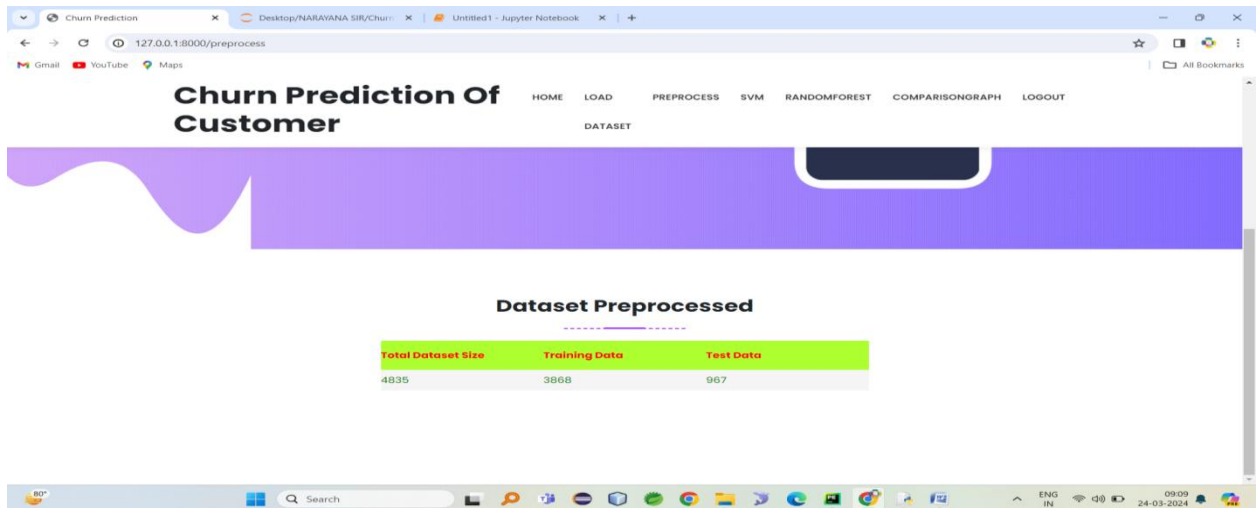
Obtain the accuracy: In this module we will get accuracies

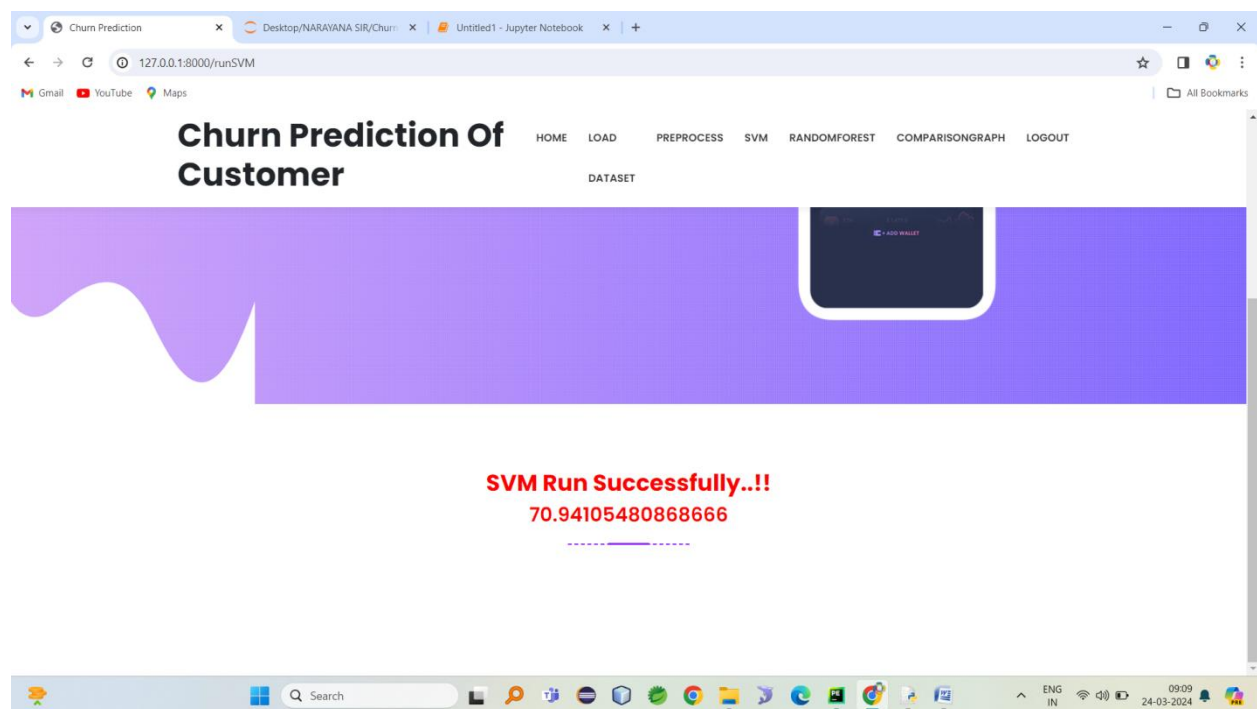Predict output: in this module, we will get output based input data

4.RESULTS AND DISCUSSION
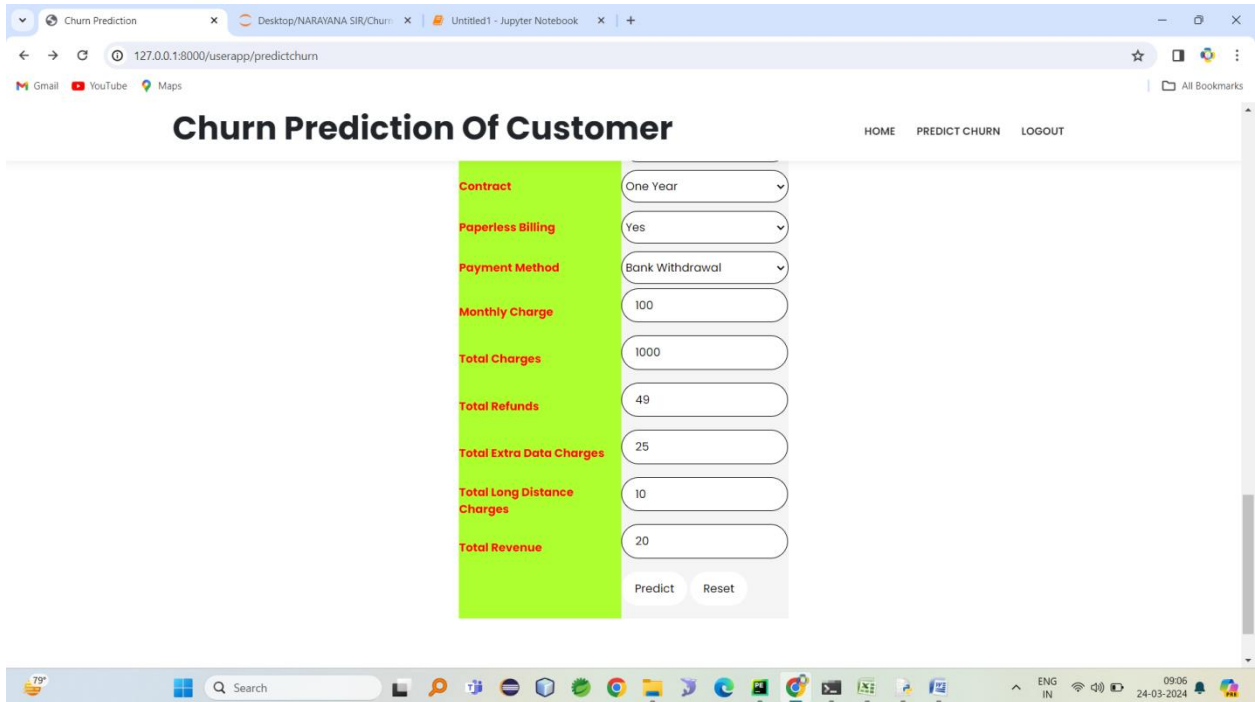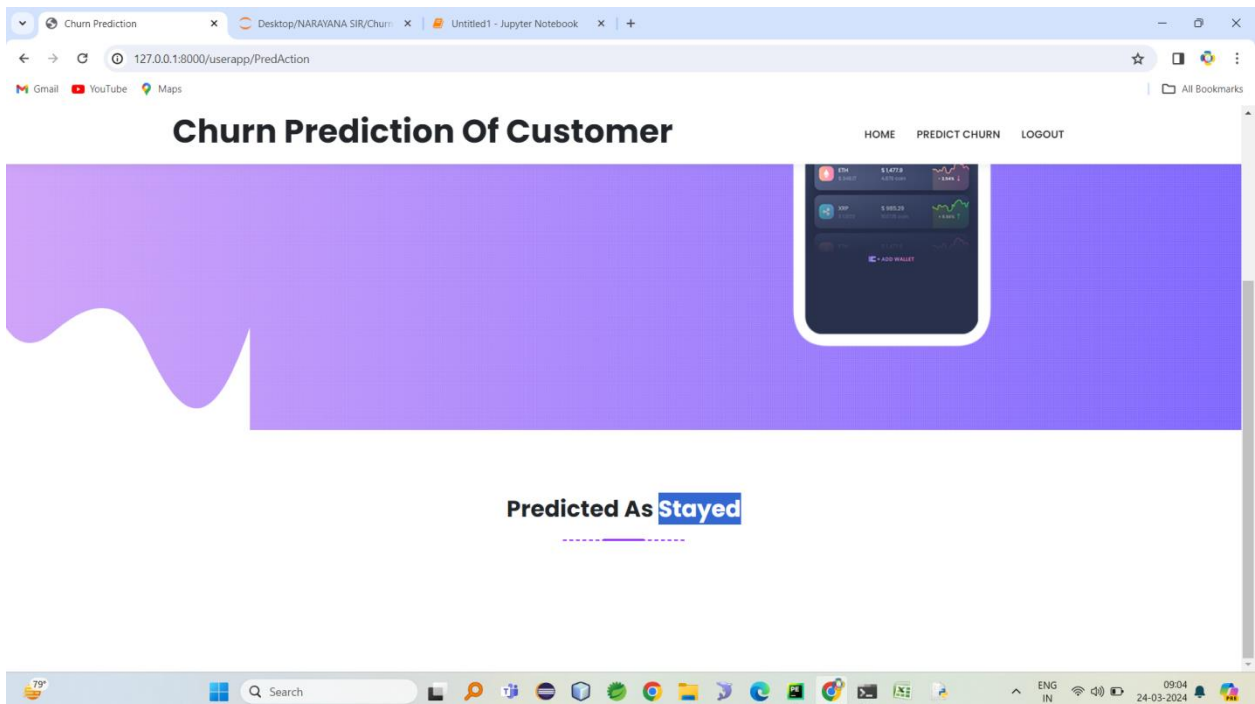
Dataset preprocess

Svm algorithm accuracy

Random forest accuracy

Comparison graph

RESULT

5.CONCLUSION

Churn prediction is a boon to many businesses, especially those in the

telecommunications industry, in terms of revenue and profitability. Organizations in the telecom business emphasize customer retention above customer acquisition since predicting client attrition is the industry's biggest difficulty. The versatility and adaptability of three tree-based algorithms made them ideal for this task. Outperforming rival technologies, Random Forest and Support Vector Machines provide more accurate outcomes. Here, we are assessing the worth of hem and producing a precise forecast by looking at a dataset that contains information about specific customers' service plans. This approach may be more effective in identifying customers who are likely to switch to other services offered by the business. The telecom company can see everything plainly and provide them deals to stay with that service.Thanks to the deployment of ML approaches, our suggested churn model surpassed the competition, according to the findings.Random Forest produced the most accurate findings. To improve our customer churn forecast, we will do more research on lazy learning techniques in the next days.Using AI approaches for trend analysis and consumer prediction, the study might be broadened to get a better understanding of customers' growing behavior.

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