

# Customer Churn Prediction in Telecom

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**Abstract:** Nowadays, customer churn analysis and prediction have become crucial in the telecom sector as telecommunication companies need to analyse customer behaviours to identify those who are likely to unsubscribe from their services. Therefore, machine learning techniques and algorithms play a vital role in today's business landscape, as the cost of acquiring new customers outweighs retaining existing ones. This project aims to utilize different machine learning techniques, including KNN, Logistic Regression, Random Forest, and SVM, to predict customer churn and compare the performance of these classification models.

**Keywords:** churn , customer ,Random forest, machine learning

## I. INTRODUCTION

The term "churner" refers to a customer who discontinues using a product or service for a specific duration. In the context of a telecommunication company, a churner is an individual who has opted for services but may potentially discontinue them in the near future, as predicted by the churn model. Churn models are commonly employed in various industries as part of data mining techniques. Mobile telephone companies worldwide are actively developing their own churn models. Moreover, churn results can be effectively utilized for multiple objectives, particularly for customer retention. The Churn Management approach serves as the initial step in model development. Instead of relying solely on a single method with the best lift, this project aims to create an automated application that can be used consistently over a long period. In the digital era, customers may have relationships with multiple telecommunication firms, utilizing different carriers based on factors like distance or plan offerings. Analyzing customer experience through machine learning can provide valuable insights. Some individuals may switch service providers intermittently, while changes in call rates may be influenced by job responsibilities. The analysis may vary depending on the availability of data and different situations encountered.

## II. PROPOSED SYSTEM

The proposed system aims to develop a churn prediction model for the telecommunication industry, machine learning techniques. The system will focus on building an automated application that can effectively predict and manage customer churn. This system provides the telecommunication industry with an efficient tool for predicting customer churn and implementing proactive measures to retain customers.

## III. METHODOLOGY

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. Acquisition and the retention of customers are the top most concerns in today's business world. The rapid increase of market in every business is leading to higher subscriber base. Consequently, companies have realized the importance of retaining the on-hand customers. It has become mandatory for the service providers to reduce churn rate because the negligence could be resulted as profitability reduction in major perspective.. This project focuses on various machine learning techniques for predicting customer churn through which we can build the classification models such as KNN,logic Regression, Random Forest and SVM and also compare the performance of these models.

**IV. SYSTEM ARCHITECTURE**

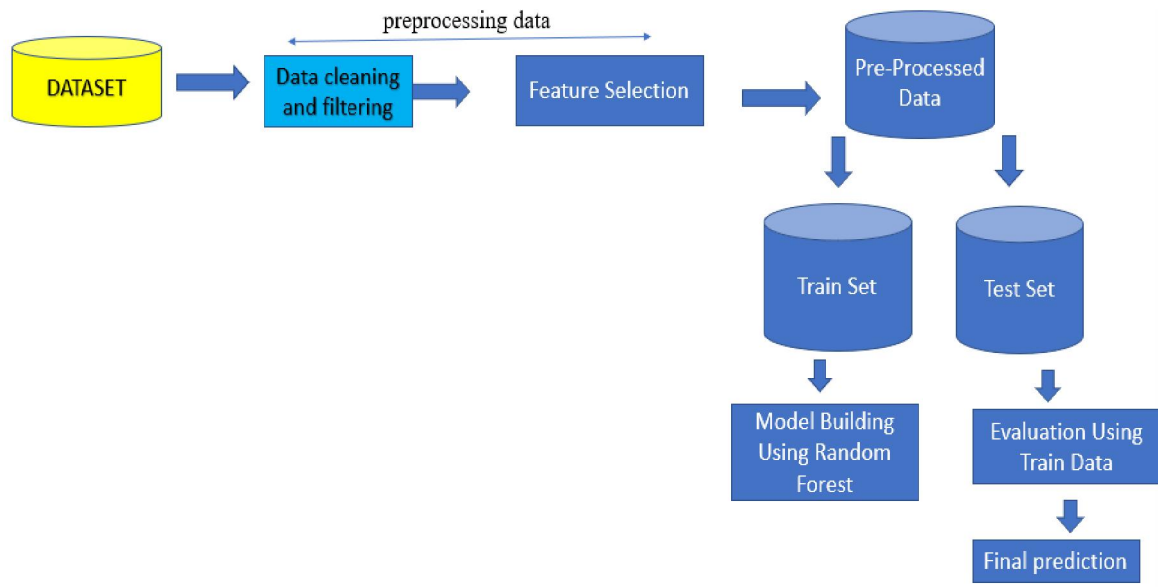


Fig.1.SystemArchitecture

**IV. CONCLUSION**

In conclusion, predicting customer churn is an important task for telecom companies to retain customers and reduce business costs. In this project, we used four machine learning algorithms: KNN, Random Forest, SVM, and Logistic Regression, to predict customer churn in the telecom industry. We collected the data from a publicly available dataset and pre-processed the data to ensure that the models could learn effectively.

In the results showed that all four models achieved high accuracy in predicting customer churn, with Random Forest achieving the highest accuracy of 97.3%. We also evaluated the models based on other performance metrics such as precision, recall, and F1-score, and found that all four models performed well in terms of these metrics.

**V. FUTURE SCOPE**

The future scope of customer churn prediction in the telecom industry using KNN, Random Forest, SVM, and Logistic Regression is vast and can lead to many potential research directions. The future scope includes the use of deep learning techniques, real-time prediction, personalized churn prediction, integration with other data sources, and cost-benefit analysis. These areas of research can help improve the accuracy of churn prediction models, provide additional insights into customer behaviours, and enable telecom companies to offer personalized retention strategies to customers.

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