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Enhancing Customer Analytics: A Comprehensive Framework for Effective Churn Prediction

[1]Ms. Anitha R, [2]Mr. Adithyan P S, [3]Ms. Akshaya V A, [4]Mr. Bhuvanesh A
[1]Assistant Professor, Department of Computer Science and Engineering
[2 3 4]Students, Department of Computer Science and Engineering
SRM Valliammai Engineering College, Chennai, Tamil Nadu, India

Abstract: *This paper presents a comprehensive framework designed to forecast churn rates within organizations and provide visual representations for proactive and reactive analyses. Churning is the process of customer discontinuation from a product or service due to dissatisfaction or shifting needs of customers. Since keeping current clients comes with a considerably cheaper cost, acquiring new ones is no longer a smart business plan. By leveraging historical customer data encompassing demographic, behavioral, and transactional attributes, predictive models are developed and evaluated. Given that we already have all of the current customer's data, retention is far more affordable and successful. This paper aims at improving the accuracy and gives a churn prediction model which is suitable for all organizations. There are Five main components in this framework: Data preprocessing, pattern recognition, exploratory data analysis(EDA), Gradient Boost algorithm (ML algorithm to identify whether the customer is satisfied with the service or not) and Churn prediction. The churn prediction will give the results as reactive and proactive analysis. We have used the Gradient Boost algorithm (ensemble learning technique) along with SMOTE-ENN in this paper which gives us an accuracy of 95%.This gradient boost algorithm gives the best accuracy when compared with other machine learning algorithms like, Logistic Regression, Random Forest Classifier and Decision Tree Classifier. Visualization of churned data and risk analysis is facilitated through Power BI.*

Keywords: Gradient Boost, Exploratory Data Analysis, churn prediction, SMOTE-ENN

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