

Dynamic Churn Prediction using Machine Learning Algorithms - Predict your customer through customer behavior

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ABSTRACT

Currently, customers are getting more attracted to the quality of service (QoS) provided by organizations. However, the current era is evidencing higher competition in providing technologically advanced QoS to customers. Nevertheless, efficient customer relationship management systems can be advantageous for the organization in gaining more customers, maintaining customer relationships, and improving customer retention by adding more profit to the organizational business. Furthermore, the machine learning models such as support vector machine algorithms can add more value to customer retention strategies.

Keywords: *Customer Relationship Management, Customer Retention, Machine Learning, Support Vector Algorithm*

I. INTRODUCTION

Digital marketing is the marketing of products or services using digital technologies, mainly on the Internet, which includes mobile phones, display advertising, and any other digital medium (Parsons et al., 1998), (Jerry et al. 2002). This term is mostly referred to as data-driven marketing. Currently, digital marketing has changed the way brands and businesses use technology for marketing. As digital platforms are increasingly incorporated into marketing plans and everyday life, and as people use digital devices instead of visiting physical shops, digital marketing applications are becoming more prevalent and efficient (Yasmin et al. 2015), (Ige et al. 2019). Digital marketing techniques such as search engine optimization (SEO), search engine marketing (SEM), influencer marketing, content automation, campaign marketing, etc have been greatly researched in the literature. Consumers are constantly connected digitally all the time, through their smart devices, tablets, gaming consoles, and every application, service, and channel accessible through these devices. Retail banks use big data analytics for fraud prevention. Big data analytics is the process of examining large and varied data sets (big data) to uncover hidden patterns, unknown correlations, market trends, customer preferences, and other useful information that can help organizations make more informed business decisions. Chen et al. (2014) refer to big data as the ever-increasing data deluge in terms of volume, variety, velocity, and complexity that is being generated in today's digital ecosystem. Big data sets are generated around customers based on their online purchase behavior, website clicks, social media activities log, smart connected devices, geo-location attributes, etc. Sophisticated analytics solutions for big data provide new approaches to addressing some of the key marketing imperatives and delivering impressive results. (Sagiroglu et al. 1998). These solutions can transform traditional marketing roles and improve how to execute essential marketing functions. Marketers are collecting the data produced from a variety of live customer touchpoints to paint a complete picture of each customer's behavior. Analyzing this large amount of data in motion enables marketers to fine-tune customer segmentation models and apply the insights to develop customer engagement strategies and improve the value of a customer. Multiple big data applications are showing tremendous potential for driving marketing impact in the customer management domain. Marketing analytics involves information gathering and processing of a particular market to aid decisions on where to spend the budget to gain more value. Three factors come into mind in market analytics namely, who is the customer, what are they buying and how the buying changes with time (Hauser 2007).

II. LITERATURE SURVEY

Paper 1: Predicting Customer Behavior Using Prophet Algorithm In A Real-Time Series Dataset

Author: Legion Lico, Indrit Enesi, Harshita Jaiswal

Findings:

Predicting customer buying behavior enables the business to better address its customers and enhance service level and overall profit. This paper focuses on proposing a model that predicts future period sales in a real retail department store with a low prediction error rate, and it also discovers the main sales trends over time.

Paper 2: Predictive Analytics for Predicting Customer Behavior

Author: Asniar Asniar, Kridanto Surendro

Findings:

Natural language processing, sentimental analysis, and customer behavior analysis are the key performance requirements of a successful CRM analytical module. In [9], the authors highlight the importance of machine learning in a hotel CRM. The proposed work demonstrates the benefits of machine learning and data mining to enhance customer loyalty and hospitality experience.

Paper 3: Customers' Behavior Prediction Using Artificial Neural Network

Author: Anchal Goyal , Ranpreet Kaur

Findings:

In this paper, customer restaurant preference is predicted based on social media location check-ins. Historical preferences of the customer and the influence of the customer's social network are used in combination with the customer's mobility characteristics as inputs to the model. As the popularity of social media increases, more and more customer comments and feedback about products and services are available online. It not only becomes a way of sharing information among friends on the social network but also forms a new type of survey which can be utilized by business companies to improve their existing products, services, and market analysis. Approximately 121,000 foursquare restaurant check-ins in the Greater New York City area are used in this research. Artificial neural networks (ANN) and support vector machines (SVM) are developed to predict customers' behavior regarding restaurant preferences. ANN provides 93:13% average accuracy across investigated customers, compared to only 54:00% for SVM with a sigmoid kernel function.

III. PROBLEM STATEMENT

To develop and install a system that uses data mining and machine learning to forecast the likelihood of customer behavior. Customers always play a crucial part in boosting the income and profit of any company; as a result, organizational managers must maintain an effective customer relationship management system by identifying their target clients and building strong relationships with them. When employing a machine learning algorithm to automate this procedure, the system will first recognize certain body language and expression patterns in the consumers before choosing which customer to concentrate on.

IV. IMPLEMENTATION

Due to digitalization and the broad variety of products and services offered to customers, churn management has become more important than ever. As mentioned in the Section, from a business perspective, churn

management as a part of customer relationship management includes two tasks. The first task is to predict which customers might churn and the second task is to determine retention strategies, such as customer loyalty programs, to retain those customers. Retention strategies are developed to increase long-time profitability. If such strategies are successful, the need for seeking new customers decreases and allows firms to focus on existing customers and building relationships with them. Long-term customers tend to be less sensitive towards churning and competitive offers and generate bigger profit margins.

V. RESULTS AND DISCUSSION

The objectives of this study were to construct a binary churn prediction model and compare different types of algorithms for the built model. Furthermore, we have studied the effects of balancing the training dataset for the considered model. For our churn prediction model, we constructed and analyzed classifiers using three different algorithms, that is, XGBoost, Random Forest, and Naïve Bayes. For each algorithm, we used three different sampling methods: SMOTE, RandomUnderSampler, and SMOTEENN, to investigate whether a balanced dataset would improve our models' performance on customer churn prediction. Our results indicate that our built churn prediction model can accurately predict churners based on the low rate of False Negatives and False Positives. This is valuable for firms since we could target actual churners with preventative measures and stop wasting money on customers with no intentions of leaving. Yet an accurate churn prediction model alone is essential but it will only help companies determine potential churners. To bring complete value to a firm, retention strategies toward those specific customers are necessary

VI. LIMITATIONS

This research was conducted in collaboration with a company that works within the financial administration sector. This study will be limited to B2B enterprises for multiple reasons, one being that the company used for this study only deals with other companies. Another reason would be that customer churning within B2B is less studied compared to B2C. Due to the time limit and complexity, three different supervised learning algorithms, based on previous literature, were chosen for comparison and evaluation. In a perfect world, there are a lot of different algorithms and techniques that can be used for predicting customer churning, and using a number of these algorithms means that they are not all utilized, which is why this is considered a delimitation. Due to limitations in raw data, the attrition rate will not be considered. Predicting customer churning can be used to lower costs and improve a firm's revenue streams, however, this study will not cover such economic aspects.

VII. CONCLUSION

Therefore, from the above discussion, it can be concluded that, regardless of the type of organization, every organization needs to be concern about customer churn. Customer retention is the process of maintaining the loyalty of the customer by understanding the customer's demand and serving them accordingly. A powerful churn prediction model will help organizational management to predict customer churn. Depending on the complex data of the telecommunication industry, support vector machines can be turned out advantageous for predicting the churn rate. The above report has focused on the concept of customer retention along with churn prediction. Apart from that, the use of a support vector machine to enhance the churn prediction process has been discussed here along with the algorithm.

VIII. REFERENCES

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