

INSURANCE CUSTOMER RETENTION USING OPEN SOURCE TOOLS

Customer Retention Analytics Using Open Source Tools (R-Studio)

Overview

One of the Insurance client of Pyramid IT consulting who wanted to measure the number of clients who are likely to discontinue their service and also the underlying reasons associated with it. Customer retention analytics is a powerful way to retain policyholders and gain profits. In this case study we talk about one such client who needed customer retention analytics using predictive models (that uses statistical techniques and machine learning algorithms) to correlate policy cancellation factors and show pattern that help predict most probable churn triggers in the future.

Business Objectives

- ▶ To analyze customer churn, i.e., identify the number of customers who are likely to cancel a (policy) subscription in a given time period.
- ▶ To keep customer churn in an acceptable range and know what factors are causing customer churn.
- ▶ To recognize when customers subtly shift segments of their business.
- ▶ Helping companies find and address churn inducing factors like high premiums, poor customer service or claim response times using churn analysis.

Churn Analysis Using Predictive Models

A predictive model utilizes statistical techniques and Machine Learning (ML) algorithms on the customer data to deliver realistic predictions. In insurance churn analysis, predictive models can be used to correlate policy cancellation factors and show patterns which help predict the most probable churn triggers in the future.

Business Benefits

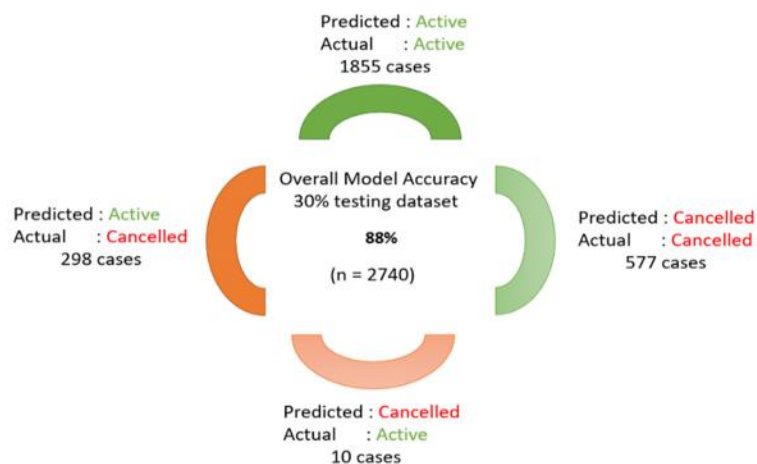
- ▶ Formulated growth strategy to retain existing customer business which is more valuable than winning new business.
- ▶ The Churn Analytics module helped increase customer retention, especially for businesses with large numbers of customers or products.
- ▶ Recognized when customers subtly shift segments of their business.
- ▶ Used this advance knowledge to keep profitable customers in the fold and reward loyal customers for their ongoing repeat business.
- ▶ Developed a target list of customers, who can buy specific products.

Business Solution

In insurance churn analysis, predictive models can be used to correlate policy cancellation factors and show patterns which help predict the most probable churn triggers in the future.

Pyramid's Churn Prediction methodology involved the following:

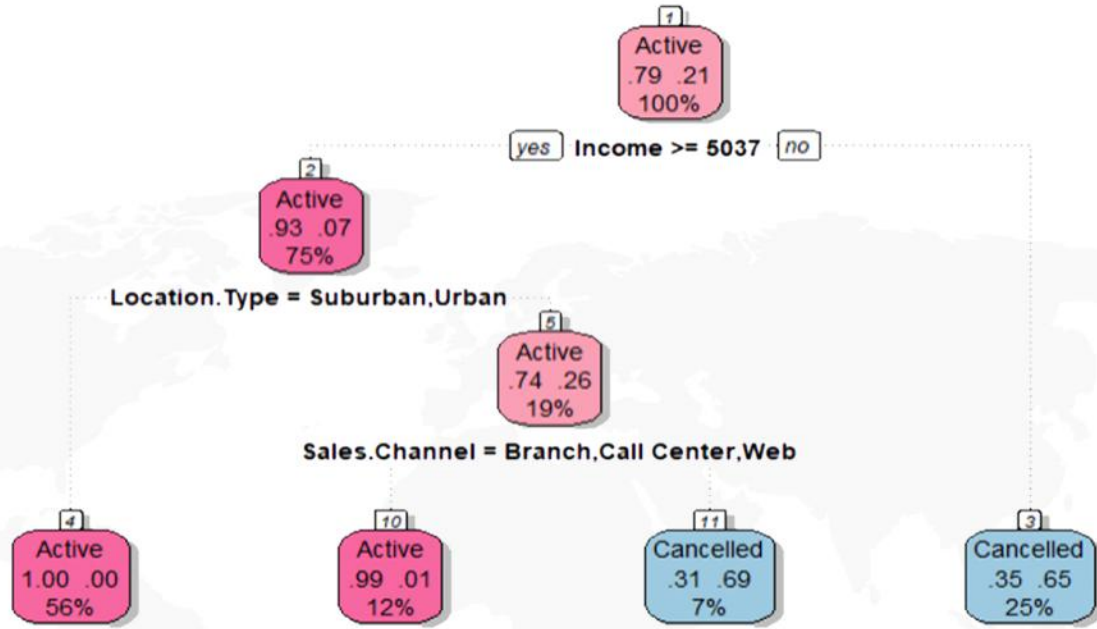
- ▶ **Problem Definition** - we had to deal with a binary classification problem i.e., to predict whether a customer will churn or not churn.
- ▶ **Understand Data** - customer's data was collected and understood. It had various data points like customer demographic information, policy data, claims data, customer interactions data.
- ▶ **Data Processing** - missing values and outliers were removed and exploratory data analysis was done.
- ▶ **Feature Engineering** - identified significant variables, normalized the variables and created dummy variables for categorical data.
- ▶ **Data Splitting** - data was split into training (70%) and testing data (30%).
- ▶ **Model Building** - since it's a classification problem, various models like logistic regression, decision tree, random forest, gradient boosting, SVM, etc were evaluated on the following parameters.
 - Confusion matrix (accuracy, sensitivity, specificity, precision, F1 score)
 - AUROC curve
 - Cumulative Gainplot



Values obtained from Confusion Matrix.

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It was observed that decision tree model was performing best among the above models. Business rules are created based on a tree like structure from the decision tree model as shown below:



Model deployment - After performing model building, the model was consumed using API.

Result

- ▶ Using confusion matrix, the insurance customer churn prediction accuracy was 88.7%. This enabled the client to target these customers and retain them thus saving huge cost on acquiring new customers.
- ▶ When selected 30% customer with high probability, the Decision Tree model was able to correctly predict 93% of these customers that are likely to churn (cancel policies).

Conclusion

- ▶ With significantly less effort, a company will know which customers are canceling their policies in advance.
- ▶ Higher customer retention leading to lower costs and higher profitability.
- ▶ Higher customer satisfaction.

About Pyramid

Pyramid Consulting Inc. is a global technology and process driven software solutions company offering customer centric solutions. With knowledge and experience of the entire IT lifecycle, we help enterprises streamline core IT processes and augment their competitive advantage. Pyramid's global delivery model harnesses productive tools, agile methodologies, iterative processes and expert frameworks to provide innovative and cost-effective solutions.

Our domain and industry experts engineer robust technology solutions for clients in a wide range of industries including retail, logistics, healthcare, insurance, software development, financial services, media, publishing and telecommunications.

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