

Predicting and Preventing Customer Churn

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Which Domain?

Banking domain will be used for this project and the data will be studied to identify the reason for customer attrition. I will investigate the data to identify the behavior of customer and product along with its relationship. The reason for the customer to stop his or her relationship with a company will be studied as part of this study so that possible action can be taken to stop customer from leaving.

References & Annotations:

1. Solving the Merchant Attrition Problem- Retrieved from
<https://www.paymentsjournal.com/solving-the-merchant-attrition-problem/>
Customer Attrition has always been one of the key challenges impacting the bottom line in any industry and so is it for the Merchant acquiring industry.
2. Merchant attrition is a big problem. Can big data help? – Retrieved from
<https://www.paymentssource.com/news/merchant-attrition-is-a-big-problem-can-big-data-help>
Using good, old-fashioned customer service and consultation to cut down on merchant attrition has been part of the acquiring playbook for years. But that playbook is long overdue for an update.
3. How to Reduce Merchant Attrition in the Age of the Retail Tech Ecosystem
<https://www.gboomtown.com/blog/reduce-merchant-attrition>
One of your merchants takes off for a competitor. You immediately lower your prices. Except, the merchant doesn't return. That's because merchant attrition is not all about pricing. Managing the churn of merchants starts with understanding the nature of the problem at the outset. There are a number of common issues that lead to merchant attrition.
4. Solving Merchant Attrition using Machine Learning
<https://medium.com/@ODSC/solving-merchant-attrition-using-machine-learning-989e41e81b0e>
Merchant attrition is a major problem not just in the financial industry but in any sector (substitute 'merchants' with 'customers' in a given business). The difficulty lies in identifying churn-probable merchants.
5. Best Practices: Merchant Retention
<https://www.spsprocessing.net/sites/default/files/education/ETA%20MerchantRetention.pdf>
While a modest economic recovery appears to be underway among merchants, merchant attrition remains a concern for many companies in the acquiring industry. Effective merchant retention strategies and best practices are an important and cost-effective tool to minimize attrition and stabilize portfolios.
6. Client attrition is a big problem

<https://tdtanalytics.com/client-attribution-is-a-big-problem/>

Good, old-fashioned customer service to cut down on merchant attrition has been part of the approach by merchant processors and ISO's for years. But that is long overdue for an update. A newer concept is to aggregate customer data from various sources prior to any real problems surfacing to get a better handle on what merchant clients think of their payment's services.

7. First Data's Small-Merchant Attrition Improves, but Leads from Bank Joint Ventures Soften
<https://www.digitaltransactions.net/first-datas-small-merchant-attribution-improves-but-leads-from-bank-joint-ventures-soften/>

First Data Corp. reported Monday that transaction volume in its North American merchant-acquiring business grew 7% year-over-year in the first quarter to 11.5 billion. Attrition in First Data's direct small and mid-sized (SMB) merchant business, which had been a problem for more than a year, improved, but sales leads from the leading payment processor's bank joint-venture partners weakened.

8. Challenges & Opportunities for Merchant Acquirers
[https://www.capgemini.com/wp-content/uploads/2017/07/Challenges Opportunities for Merchant Acquirers.pdf](https://www.capgemini.com/wp-content/uploads/2017/07/Challenges_Opportunities_for_Merchant_Acquirers.pdf)
In the rapidly changing global payments landscape, merchant acquirers face increasing challenges which bring new opportunities

9. Data Proves Reduced Churn When Merchants Are Given Value
<https://reformingretail.com/index.php/2018/05/15/data-proves-reduced-churn-when-merchants-are-given-value/>
Merchant acquirers are gobbling up the brick and mortar ecosystem. Their large budgets and massive distribution make them a formidable yet necessary force in the industry. But at the same time their core product – payments processing – is the definition of a commodity. Merchants are learning that payments services are all the same, and there's no real difference between providers. So, when someone shows up on your door with a cheaper option, you jump.

10. Strategy Considerations for Acquirers
<https://usa.visa.com/dam/VCOM/regional/na/us/partner-with-us/documents/vca-thought-leadership-considerations-for-acquirers.pdf>
An important trend within the merchant acquiring space over approximately the last five years has been the rise of integrated payments, which is the seamless integration of payments functionality into business software solutions. Integrated Software Vendors (ISVs) are the principal actors in the integrated payments space, and their emergence is one of the key growth drivers for acquiring revenue. In the last five years, acquiring revenues derived from integrated payments have grown considerably.

Which Data?

2018 Churn modelling data from Kaggle site will be used for prediction of customer at a Bank. Additional dataset might be used as part of the project. Following are the features I will look to study for this use case.

- CreditScore

- Geography
- Gender
- Age
- Tenure
- Balance
- Num Of Products
- HasCrCard
- IsActiveMember
- EstimatedSalary
- Exited

Data Sources:

- https://www.kaggle.com/shrutimechlearn/churn-modelling - Churn_Modelling.csv
- Additional dataset might be used.

Research Questions? Benefits? Why analyze these data?

How are you proposing to analyze this dataset? This is about your approach. Here, you'll be proposing your research questions as well as justifications for why you'd offer these data in this way.

With this data I will try to identify the factors for customer attrition. I will look into the following questions as part of the data discovery to:

- Understand the business process.
- Understand what data are available.
- Understand the services it provides to the business.
- Understand the competitor in the market.
- Understand the product it offers.
- Understand similar product/service available in the market
- Understand the data history we have available.
- Relationship with the customer and how different ways we serve customer.
- Create data visualization to look into the model performance and data distribution.

What Method?

What methods will you be using? What will those methods provide in terms of analysis? How is this useful?

The data available is from the 2018 churn modeling Data obtained from Kaggle. It has customer data such as their Credit Score, Geography, Age, Balance, Tenure, etc. from 2018. Data exploration and data preparation are key to the success of building a good model. Data exploration will be performed using Python, R, and data visualization to study the shape, summary, and data types for given Kaggle dataset.

Exploration and analysis will be very helpful in preparing the data for model training and feature generation. The first important step is to identify the true source for the data followed by data preparation and cleaning. This step is very important because the quality and quantity of data that you gather will directly determine how good your model can be. The data gathered from various sources need to be loaded into a suitable place and prepare for our machine learning training. It involves data discovery and analysis before we have the final set for model training. I will need to split the data in two parts. The first part, used in training our model, will be majority of the dataset. The second part will be used for evaluating our trained model's performance. Sometimes the data we collect needs other forms of adjusting and manipulation. Things like de-duping, normalization, error correction, and more. These would all happen at the data preparation step.

Potential Issues?

Following are some of the risk for this project.

- Data Availability and if we have the relevant data and its significance.
- Availability of SME or Business to answer questions on product, and customer.
- Granularity of the data for e.g. product breakdown

Concluding Remarks

Tie it all together. Think of this section as your final report's abstract.

Customer Attrition has always been one of the key challenges impacting the bottom line in any industry and so is it for the Merchant acquiring industry. By being able to identify customers that are at risk, corrective actions can be taken to address the issue.

From the data exploration, status, and their relationship with the categorical variable was identified. About 20% of the customers have churned with most of the data from France. There is more female customer churn than that of male customers and most of the customers that churned are those with credit cards. The inactive member has a greater churn than the customer that are active. Neither the product nor the salary has a significant effect on the likelihood to churn.

Overall, predictions for customer churn were achieved with strong accuracy. From the review of the fitted models above, the best model that gives a decent balance of the recall and precision is the random forest where according to the fit on the training set, with a precision score on 1's of 0.88, out of all customers that the model thinks will churn, 88% do churn and with the recall score of 0.53 on the 1's, the model can highlight 53% of all those who churned. The precision of the model on previously unseen test data is slightly higher about predicting 1's i.e. those customers that churn. However, in as much as the model has high accuracy, it still misses about half of those who end up churning. This could be improved by providing retraining the model with more data over time while in the meantime working with the model to save the 41% that would have churned.

Businesses need to update and upgrade their business as per the changing need of the market. To gain a competitive edge in the market, it is necessary to focus on areas that are identified as a risk and take necessary corrective actions for it.