

Customer Churn Prediction

Case Study Project – prediction of customer churn for a bank

Defining the Problem Statement

- One of the largest bank in the country with overall portfolio of around 225000 wants us to solve a problem –

“Can you Identify which customers are likely to carry low balances in their accounts in the coming months?”

- Director, Customer Management

First of all , as an analytics expert , our first responsibility could be to understand the problem well by asking the preliminary question like what do we mean by low balances or may be about how much time we are talking about , or may be why is it even important to answer this particular question, or may be what is success metric for this project , these question can really help us to understand the problem structure and the expectation of our client.

Questions centered around the problem

- What is the underlying cause that he wants our help, or may be what is the impact the client is expecting from us?
- why we even need to predict customers who would carry low balances?
- Why now he is trying to address this particular problem?
- is there any time sensitivity involved in trying to solve the problem?
Are we working on some timeline?

These kind of question can really help us to know the impact which client is expecting if we provide the solution to them.

Who are the owners ?

- Customer Management Director
- Anyone else?
- Who all are the stakeholders it may be head of communication or marketing , to let them know that may be our action and delivery can affect their workflow, so its always a good idea to give them heads up and also to get to know more if similar kind of exercise they tried in the past or what was the success looks like ? Or may be what were the actions taken back then.

Metrics of Evaluation of Success

- What would success look like?
- How would the bank act differently if we were able to provide them solution at customer level? How would we measure the benefit out of it?

Constraints –

- Are there any trade – off? What other problems can we work upon?
- How much time and money can we spend on this to solve the problem?

Final Problem Statement

So , after discussing all these things , let us consider reach upon the conclusion which looks like -

Final Problem Statment

Let's us consider that customer management team of the bank comes up with the reply –

“we are observing falling/stagnating balance of the from the last 3 months , initially it was increasing but from the past 3 months it's falling.”

So the precise problem statement could be

“What customer segments are more likely to churn balances in the next quarter by atleast 50% considering current quarter?”

Hypothesis Generation

Hypothesis is a possible view or assertion about the problem, which may or may not be true. Here in this steps we try to be as exhaustive as we can , and try to pen down every possibility that we have in our mind, and then try and see which of these data we can collect , which is also known as hypothesis driven analysis.

Who all should be involved in hypothesis generation?

The Data Science Team and as well as the all the stakeholder team or may be the marketing and sales teams as well, because we want to be as exhaustive as possible while solving the problem and the impact of various attribute on the problem at hand.

Hypothesis Generation for our case study

We can divide this into various aspect or categories and then we can create hypothesis for each categories -

- 1- Based on Demographics
- 2 – Based on customer behavior and their interaction with the bank
- 3 – psychographic or based on customer personality
- 4 - Miscellaneous

Based on Demographics

- 1 – Are female less likely to churn than males?
- 2 – Are young customer more likely to churn?
- 3 - Are customer located in tier -1 cities are more likely to churn?
- 4 – Are married people less likely to churn?
- 5 – Are customer in low or middle income bracket are more likely to churn?
- 6 – Are older customer less likely to churn?
- 7 – Are customer in higher income bracket are more likely to churn?
- 8 - Are bachelors more prone to churn?
- 9 – Are customer with dependent(so less likely to churn?
- 10 - Are customer with no property on their name more likely to churn?
- 11 - Customer with avg. family size more likely to churn?
- 12 – Are customer staying in a joint family are less likely to churn?
- 13 - people with disability are less likely to churn?
- 14 – Are customer with no car are more likely to churn?
- 15 – are customer with no college degree are more likely to churn?

Continued...

- 16- Are customer living closer to the bank are less likely to churn?
- 17 – Are customer holding a life insurance scheme are less likely to churn?
- 18 – Are customer with 2 or more cars are less likely to churn?
- 19 – customer living outside the country are less likely to churn?
- 20- Are customer located in tier-3 cities are more likely to churn?

Based on Behaviour

- 1 – Are vintage customer less likely to churn?
- 2 – Are customer with higher average balance less likely to churn?
- 3 – Customer who uses net banking are likely to churn?
- 4 – customer who do frequent digital transaction are less likely to churn?
- 5 – Are customer who hold a government scheme are less likely to churn?
- 6 – Are customer who have not done even a single transaction from past 3 months are more likely to churn?
- 7 – Are customer who hold the credit card less likely to churn?
- 8 – Are customer who hold home loan less likely to churn?
- 9 – Are customer who hold education loan less likely to churn?
- 10 – Are customer who hold car loan less likely to churn?
- 11 – Are customer who have taken any business loan less likely to churn?
- 12 – Are customer who works on profiles like sales are more likely to churn?
- 13 – Are customer who frequently withdraw cash from ATM are less likely to churn?

Continued ..

- 14 - Are customers who have large withdrawal amount in the past month are more likely to churn?
- 15 – Are customer who have large withdrawal amount in the past quarter are more likely to churn?
- 16 – Are customers who recently unsubscribed our emails or may be unfollowed us on some social media page are more likely to churn?
- 17 – Customer who recently closed an FD account pre-maturely are more likely to churn?
- 18 – Customer who cancelled their credit/debit card in the last 6 month are more likely to churn?
- 19- Are customer with high complaint rate are more likely to churn?
- 20- customer with multiple bank accounts are more likely to churn?
- 21 – customer with low credit score are more likely to churn?

Based on Customer Personality

- 1 – Do customers with passive shopping behavior are more likely to churn?
- 2 – Do customers who switches jobs regularly are more likely to churn?
- 3 – Do customer with some criminal record in the past are more likely to churn?
- 4 – Do customer which are inherently more loyal are less likely to churn?
- 5 – Do customers who follow the stock market are more likely to churn?
- 6 - Do customers who don't answer bank calls are more likely to churn?

Miscellaneous (Competition based)

- 1 – Customer getting low rate of interest in FD's compare to some other banks are more likely to churn?
- 2 – Customer Incurring high rate of interest in home loans compare to other banks are more likely to churn?
- 3- Customer incurring high rate of interest in education or business loan compare to some other bank are more likely to churn?
- 4 – Customer getting low rate of interest in their RD's account compare to other bank are more likely to churn?

Data Collection

Data can be collected from the different sources of the bank

- 1 – Customer Demographic data – since a lot of our hypothesis are directly revolving around the background of the customer.
- 2 – Transactional data – details of the kind of transaction that the customer generally do can really us to answer many questions of hypothesis we made based on customer behavior and personality.
- 3 – Bank branch data – can really help us to know the kind of interaction and the satisfaction level of the customer towards the services of the bank.

An Important Consideration

Why do even organizations want to decrease their churn rate why they can't just only focus on acquiring new customers?

"As per the various market research reports available online whenever a company launches a new product, there are around only 5-20% chance of selling that product to a new customer, but there is around 70-80% chances of selling that product to an existing customer."

That may be also a very important reason that a company wants to reduce the churning rate, and this particular framework can really help them to design their plans considering the customers prone to churning. Which is really essential if a company wants to stay longer into the market.

Predictive modeling lifecycle

Problem Definition



Hypothesis Generation



Data Exploration and
Transformation



Data Extraction and
Collection



Predictive Modeling



Model Deployment