Consolidated Segmentation and Churn Analysis of Bank Clients

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OVERVIEW

- Customer churn has direct impact on profit.
  - Cost of maintaining existing customers is significantly less than the cost of obtaining a new one.

- The financial crisis of 2008 changed the banking sector's strategy.
  - Previously focused on acquiring more and more clients.
  - Technology and laws making things easier than ever to transfer assets and money between institutions. Which introduced new competitors in market
    - open banking
    - neo-banks
    - fin-tech businesses (Banking as a Service (BaaS))
  - Banks can use existing data to tackle client turnover challenge.

BUSINESS PROBLEM

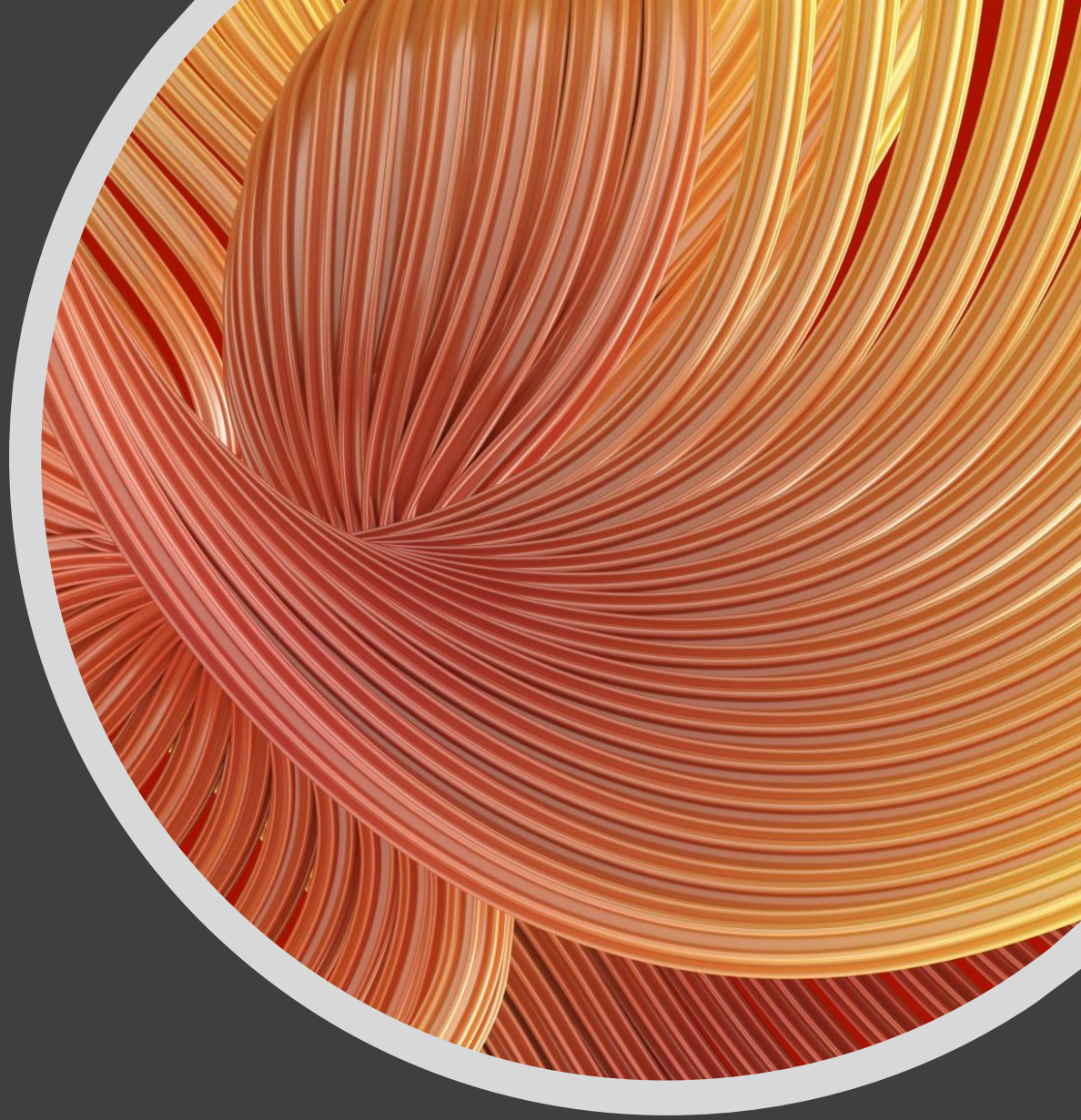
Importance of existing customer management is well recognized.

- Hard to anticipate

Feedback from customers is hard to obtain.

XYZ Bank (read: fictional) is a mature financial institution based in Eastern North America.

- New competitors in market.
- Have existing data of their clients.
- Based on the data available, the bank wants to know whom of them are in risk of churning.



METHODOLOGY

This analysis is combining churn prediction and customer segmentation.

Customer data of the bank is used for this analysis.

- 10127 unique client information.
- 18 features.

Customer segmentation: ‘K-means’ clustering.

- Divided into five clusters.

Churn prediction: Using the predictions from the customer segmentation model, a ‘XGBClassifier’ model is used

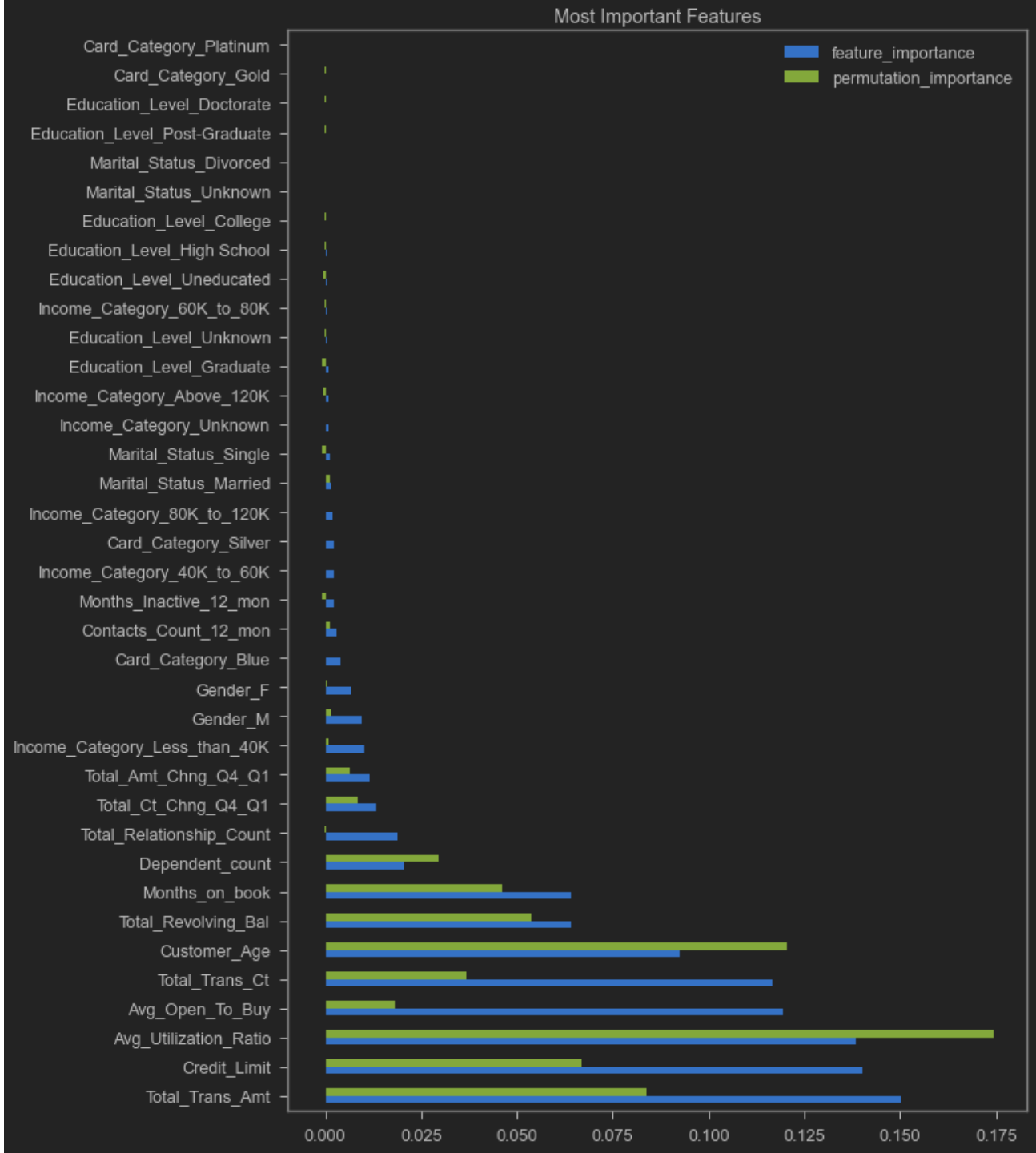
- 0.97 model accuracy
- 0.90 precision for churn class.

CLUSTERS

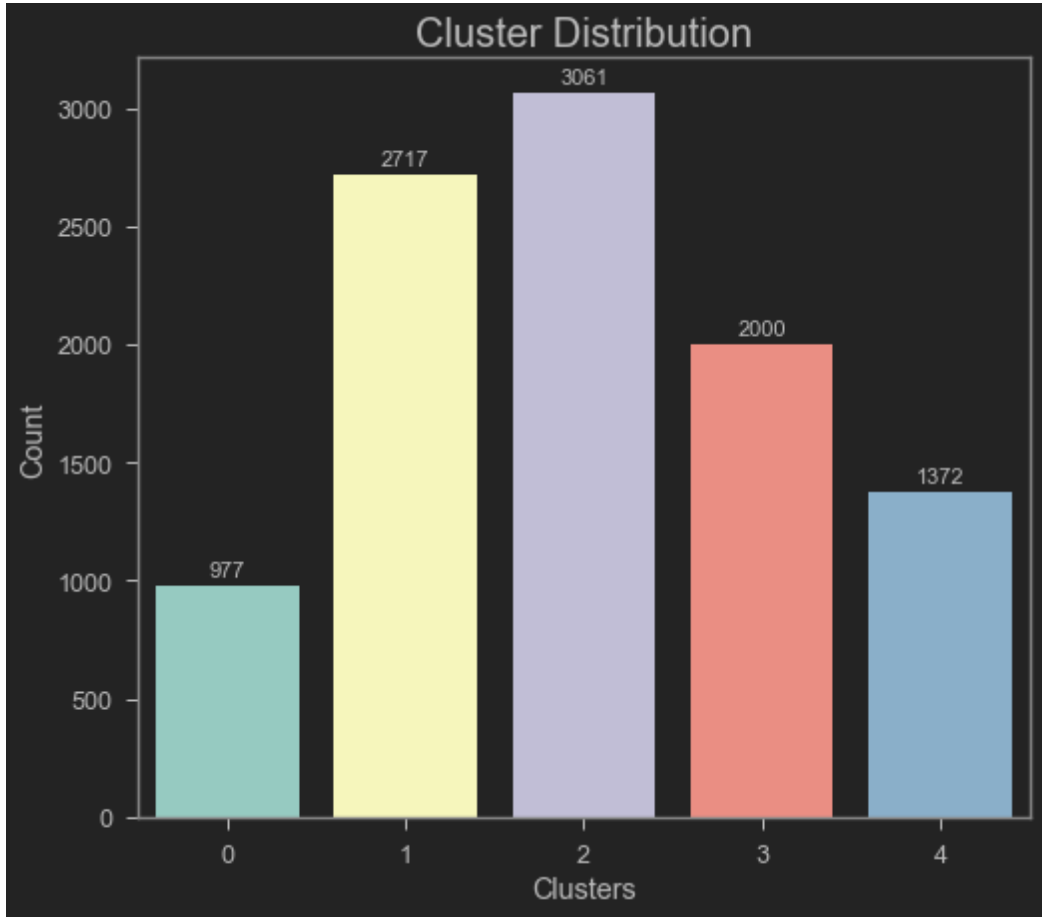
Peeking into clusters

Features that isolates client segmentation

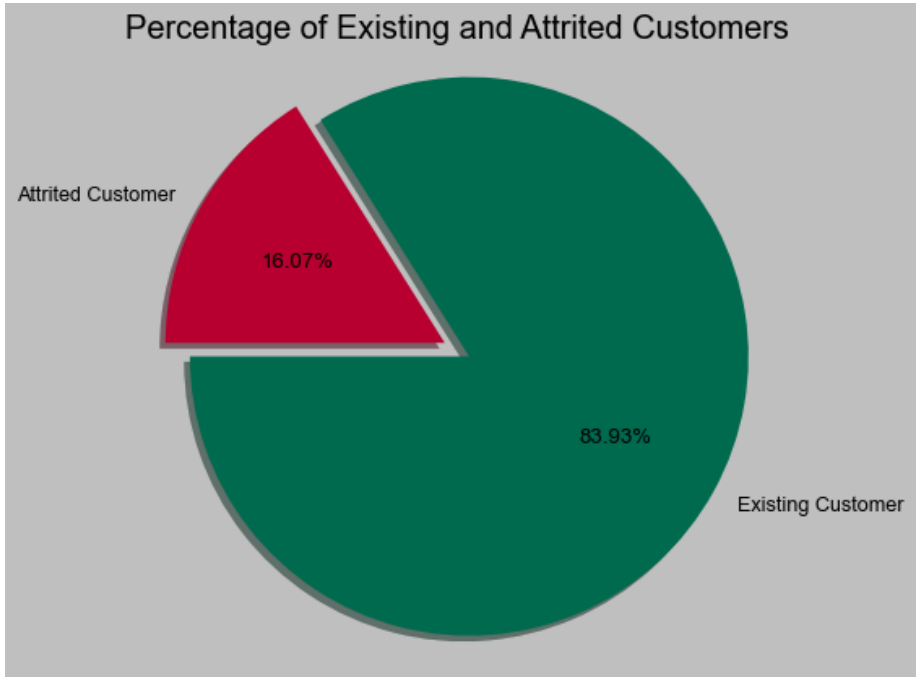
- With insights from model, these are the top most important features.
  - Total Transaction Amount
  - Credit Limit
  - Avg Utilization Ratio
  - Avg Open To Buy
  - Total Transaction Count
  - Customer Age
  - Total Revolving Balance
  - Months on book
  - Dependent count
  - Total Relationship Count



Cluster size



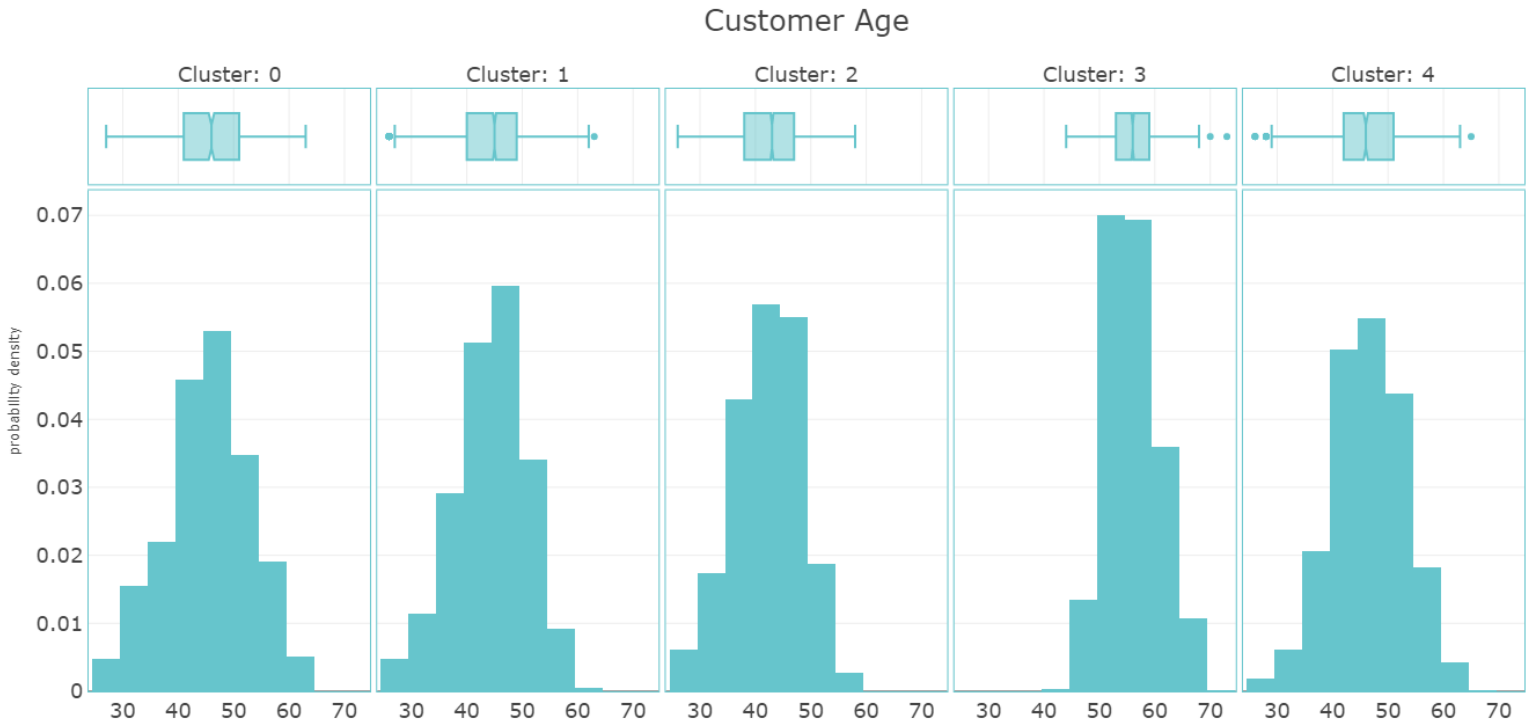
- Cluster 2 is the largest.
- Cluster 1 is next.
- Rest are close to 1k.



- 16% of customers terminated their relationship with the bank

Customer Age

- Cluster 4 and 1 has similar distribution.
- Cluster 0 is slightly younger.
- Cluster 3 is distinct as it is mostly comprised of older clients.
- Others have similar distribution.

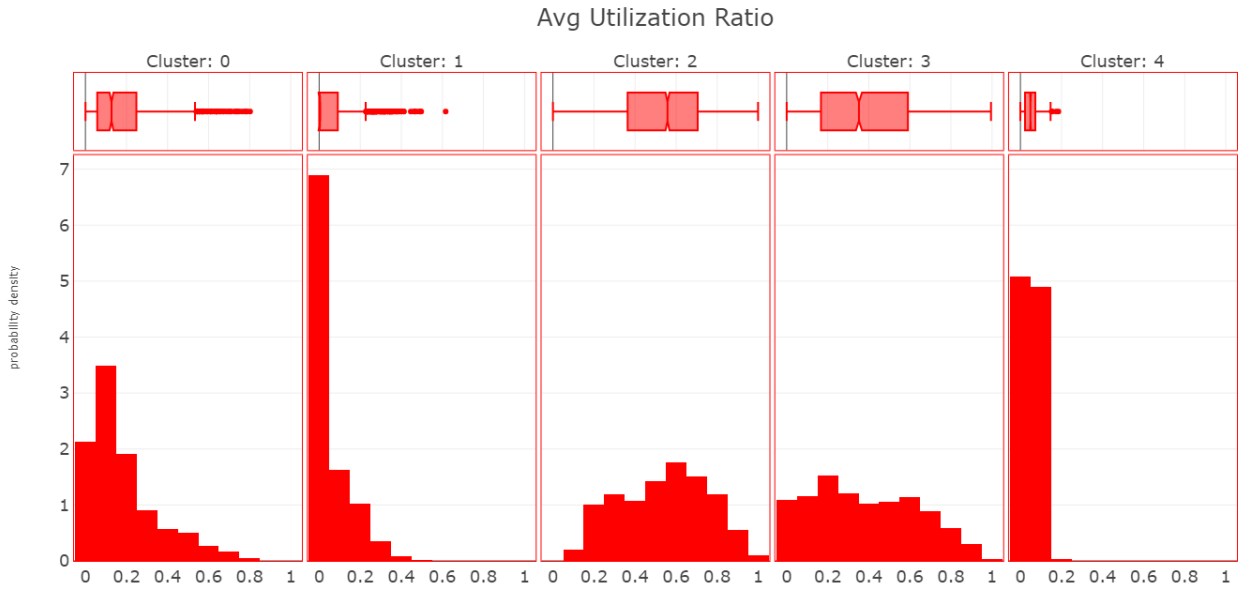


Credit Limit

- Cluster 0 has a well balanced distribution, it does not have lower credit limit clients.
- Cluster 1 has mostly lower credit limit clients.
- Cluster 2 and 3 has mostly same characteristics.
- Cluster 4 has the clients with mostly high credit limit.

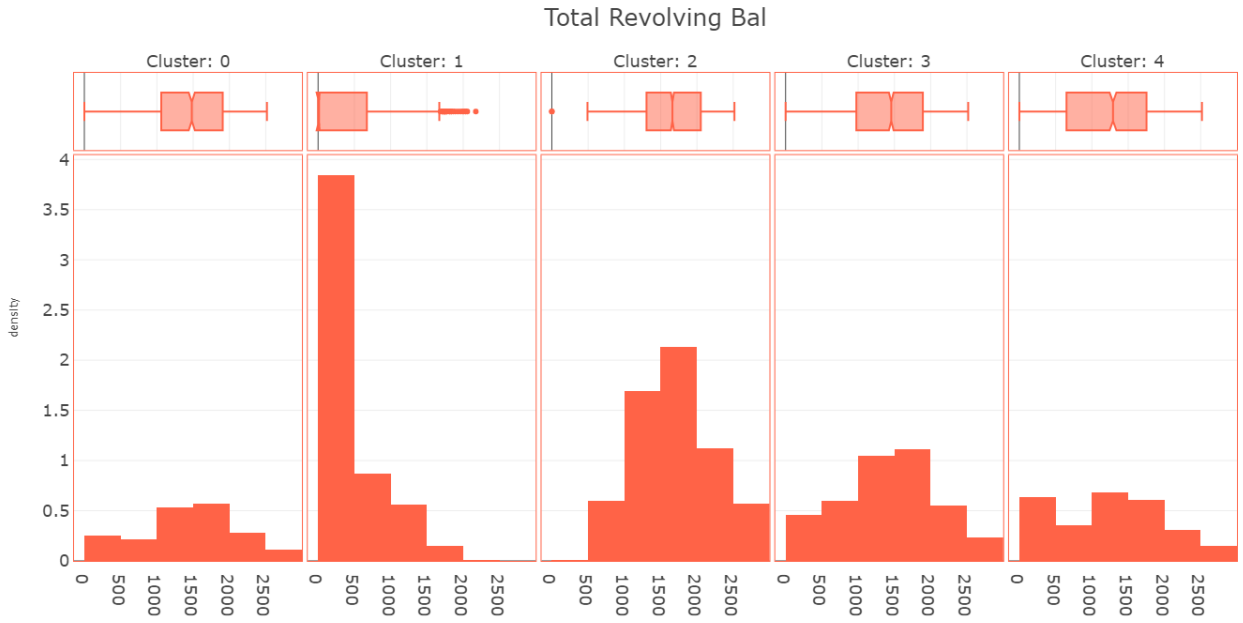
Average Utilization Ratio

- Cluster 0 shows good utilization ratio, with some 0.
- Cluster 1 has mostly less utilization ratio.
- Cluster 2 and 3 has similar utilization. Cluster 2 does not have many 0’s.
- Cluster 4 has low utilization of credit.



Total Revolving Balance

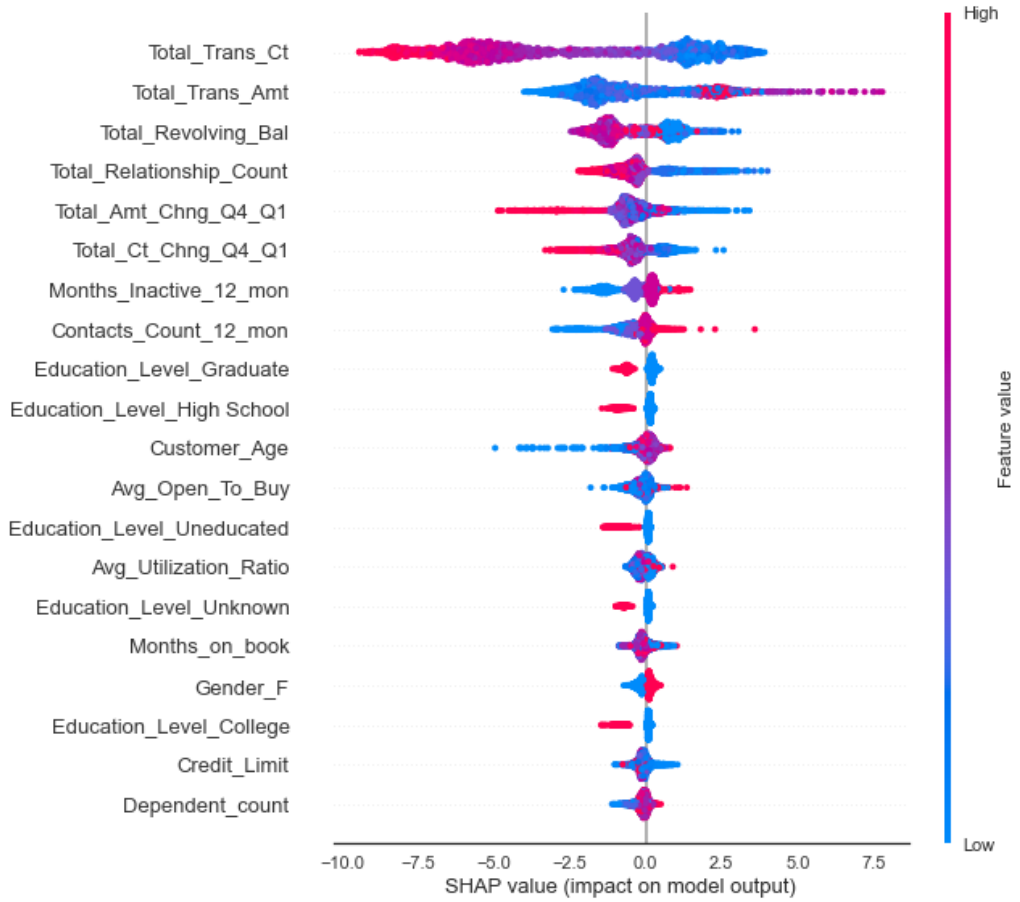
- Cluster 0 has even distribution.
- Cluster 1 has mostly low revolving balance.
- Cluster 2 does not include low revolving balance clients.
- Cluster 3 and 4 has similar distribution.



What factors alienates Clients

CHURN PREDICTION

Impact of feature values



- Total trans ct is High with high transaction

RECOMMENDATIONS

- Customer Group one is most likely to churn.
- They should be offered incentives before they churn

NEXT STEPS

THANK YOU

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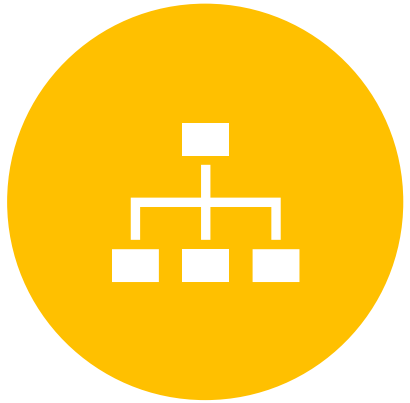

PROJECT REPO:
https://github.com/tamjid-ahsan/capstone_customer_churn

APPENDIX

Features of the dataset

Variable	Description
Clientnum	Client number. Unique identifier for the customer holding the account
Attrition_Flag	Internal event (customer activity) variable - if the account is closed then 1 else 0
Customer_Age	Demographic variable - Customer's Age in Years
Gender	Demographic variable - M=Male, F=Female
Dependent_count	Demographic variable - Number of dependents
Education_Level	Demographic variable - Educational Qualification of the account holder (example: high school, college graduate, etc.)
Marital_Status	Demographic variable - Married, Single, Divorced, Unknown
Income_Category	Demographic variable - Annual Income Category of the account holder (< $40K$,40K - 60K, $60K$—80K, $80K$—120K, > $120K, Unknown)
Card_Category	Product Variable - Type of Card (Blue, Silver, Gold, Platinum)
Months_on_book	Months on book (Time of Relationship)
Total_Relationship_Count	Total no. of products held by the customer
Months_Inactive_12_mon	No. of months inactive in the last 12 months
Contacts_Count_12_mon	No. of Contacts in the last 12 months
Credit_Limit	Credit Limit on the Credit Card
Total_Revolving_Bal	Total Revolving Balance on the Credit Card
Avg_Open_To_Buy	Open to Buy Credit Line (Average of last 12 months)
Total_Amt_Chng_Q4_Q1	Change in Transaction Amount (Q4 over Q1)
Total_Trans_Amt	Total Transaction Amount (Last 12 months)
Total_Trans_Ct	Total Transaction Count (Last 12 months)
Total_Ct_Chng_Q4_Q1	Change in Transaction Count (Q4 over Q1)
Avg_Utilization_Ratio	Average Card Utilization Ratio

Exploration