

DATA ANALYTICS CAPSTONE PROJECT

DONE BY: JOEL LIM

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PROBLEM STATEMENT

A business manager of a consumer credit card portfolio is facing the problem of customer attrition. He would like to analyze the data to find out the reasons behind the high attrition rate of the credit cards as well as the low credit card transaction values. He would also like to leverage the same on how to retain his customers who are likely to drop off.

Dataset Description

10,127 rows
19 columns
0 missing value

S/No.	Column Name	Description
1	CLIENTNUM	Client number. Unique identifier for the customer holding the account.
2	Attrition_Flag	Internal event (customer activity) variable - if the account is closed then 1 else 0.
3	Customer_Age	Demographic variable - Customer's Age in Years.
4	Gender	Demographic variable - M=Male, F=Female.
5	Dependent_count	Demographic variable - Number of dependents.
6	Education_Level	Demographic variable - Educational qualification of the account holder (example: high school, college graduate, etc.)
7	Marital_Status	Demographic variable - Married, Single, Divorced, Unknown.
8	Income_Category	Demographic variable - Annual Income Category of the account holder (< \$40K, \$40K - 60K, \$60K - \$80K, \$80K-\$120K, \$120K+)
9	Card_Category	Product Variable - Type of Card (Blue, Silver, Gold, Platinum).

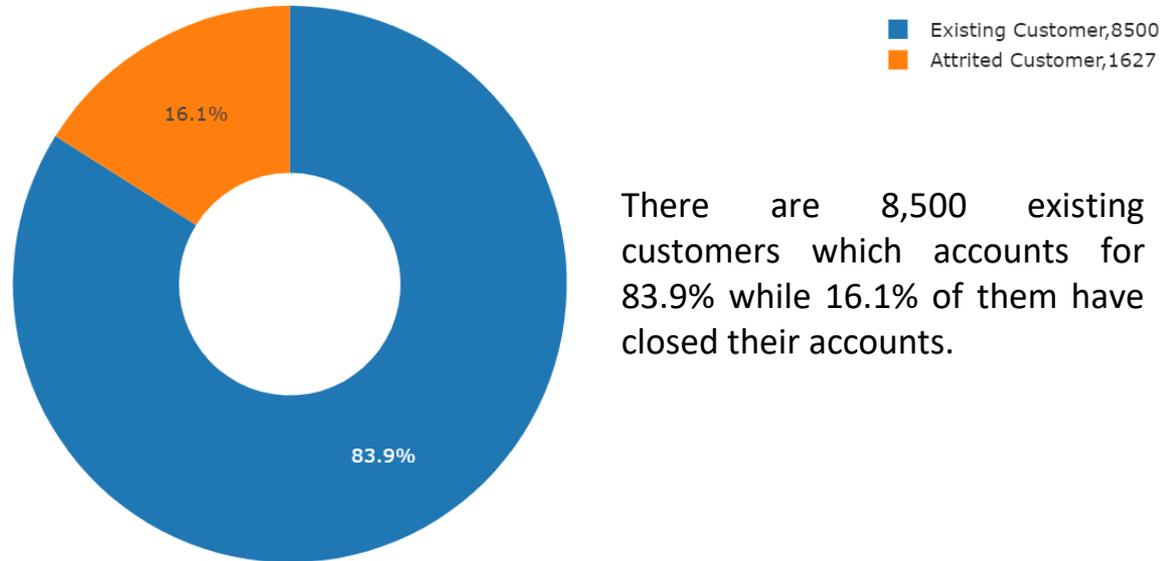
Dataset Description

10,127 rows
19 columns
0 missing value

S/No.	Column Name	Description
10	Months_on_book	Period of relationship with bank.
11	Total_Relationship_Count	Total number of products held by the customer.
12	Months_Inactive_12_mon	Number of months inactive in the last 12 months.
13	Contacts_Count_12_mon	Number of contacts in the last 12 months.
14	Credit_Limit	Credit Limit on the Credit Card.
15	Total_Revolving_Bal	Total Revolving Balance on the Credit Card.
16	Avg_Open_To_Buy	Open to buy Credit Line (Average of last 12 months).
17	Total_Trans_Amt	Total Transaction Amount (Last 12 months).
18	Total_Trans_Ct	Total Transaction Count (Last 12 months).
19	Avg_Utilization_Ratio	Average Card Utilization Ratio.

EXPLORATORY DATA ANALYSIS

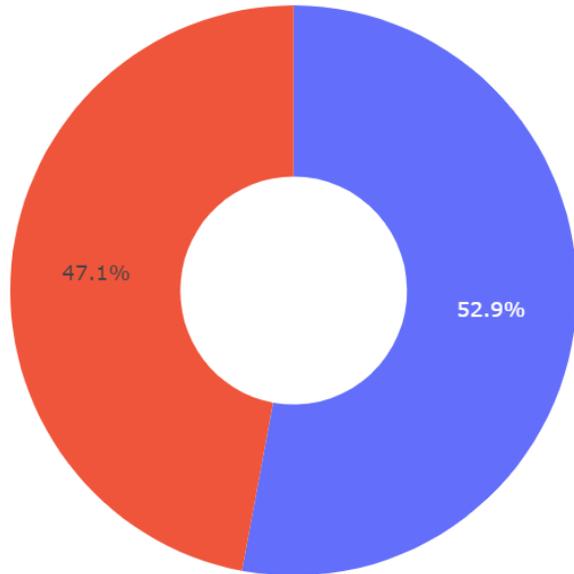
Attrition Flag of Customers



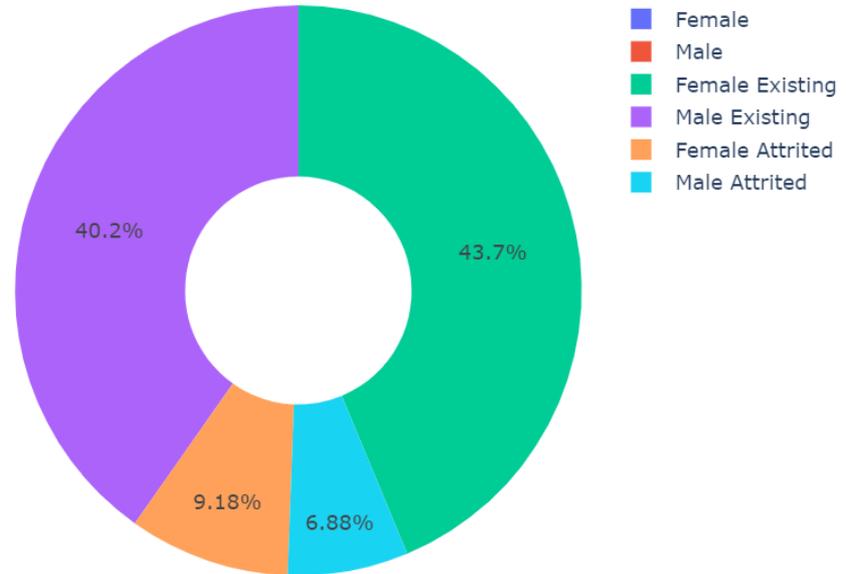
There are 8,500 existing customers which accounts for 83.9% while 16.1% of them have closed their accounts.

EXPLORATORY DATA ANALYSIS

Gender Distribution



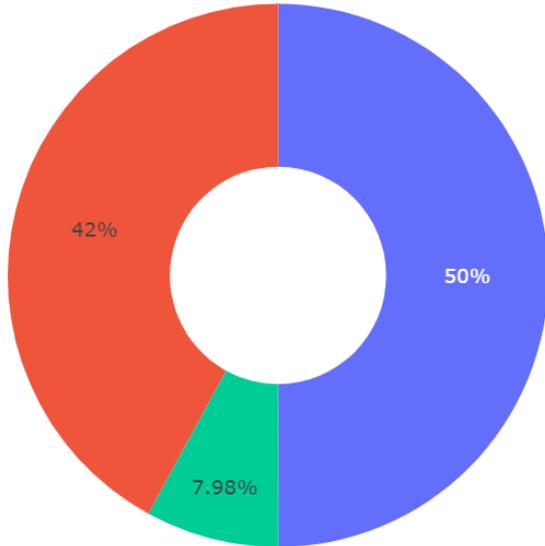
Gender vs Attrition Flag



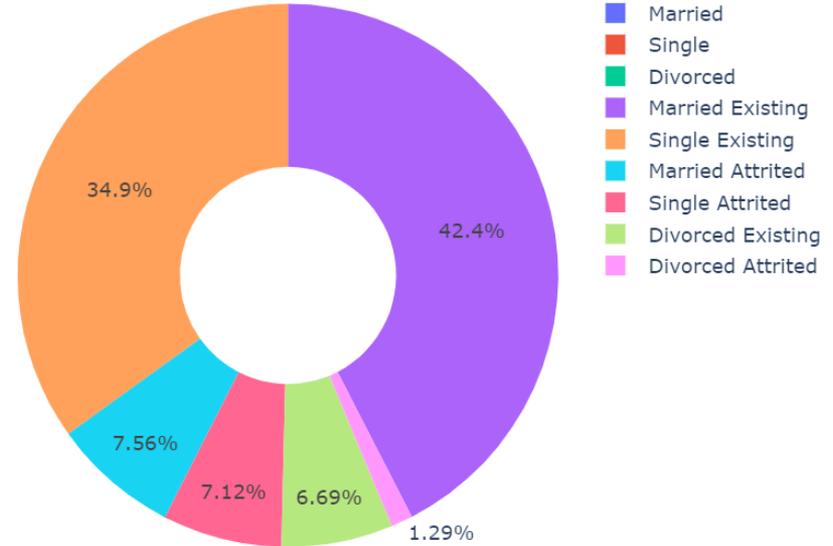
In terms of gender distribution, there are more female customers. 43.7% of the existing customers are female while 40.2% of them are male. The remaining customers have closed their accounts.

EXPLORATORY DATA ANALYSIS

Marital Status Distribution

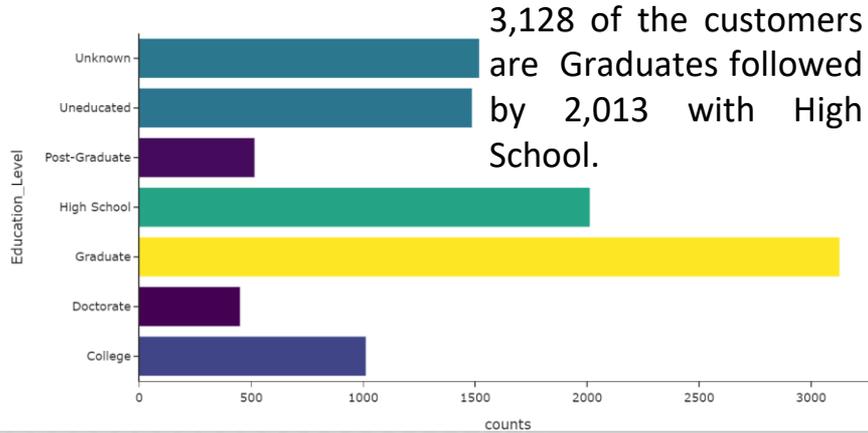


Marital Status vs Attrition Flag

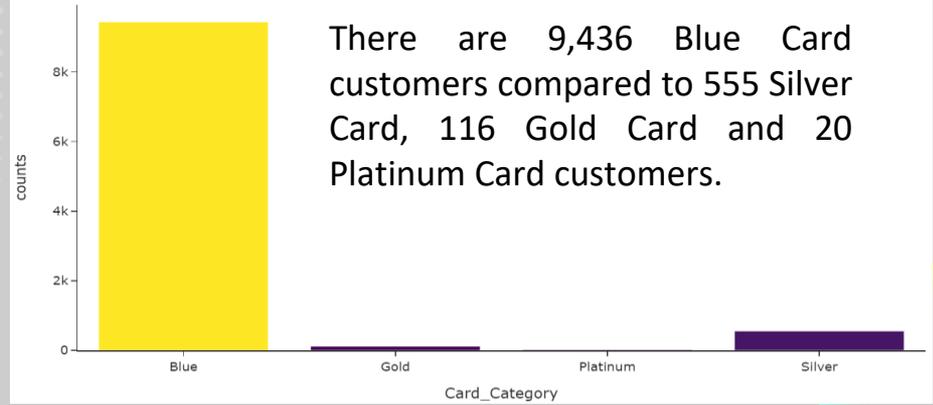


In terms of marital status distribution, there are more married customers. 42.4% of the existing customers are married while 34.9% of them are single and 6.69% are divorced. The remaining customers have closed their accounts.

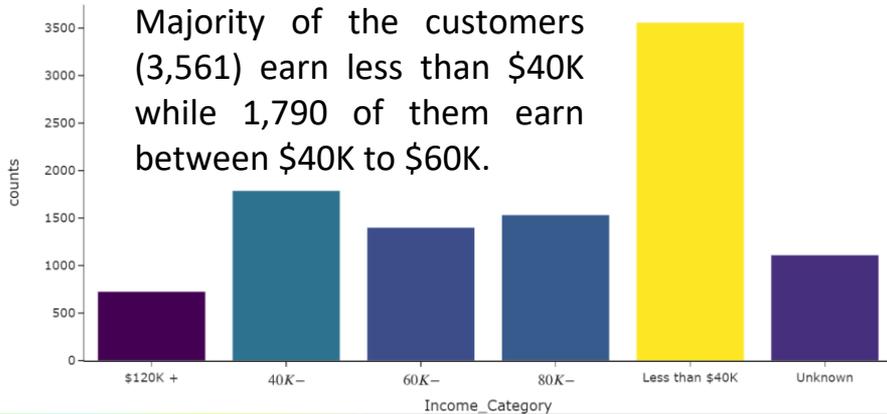
Education Levels of Customers



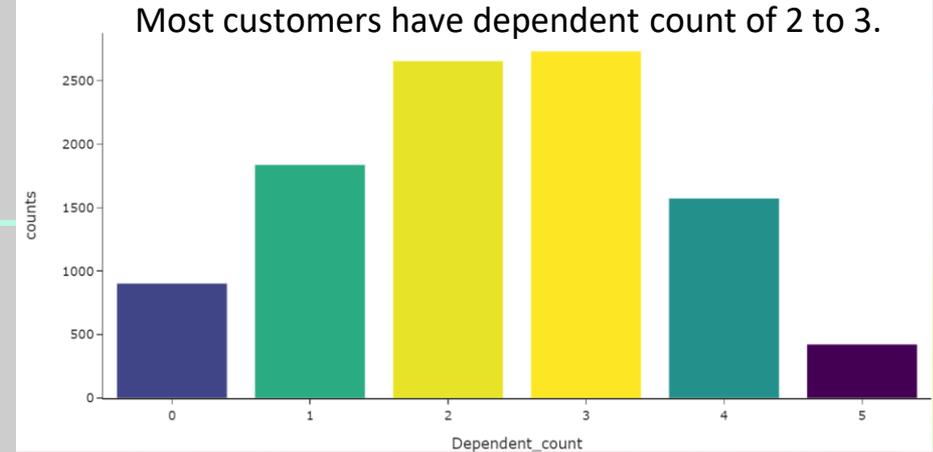
Card Category of Customers



Income Category of Customers

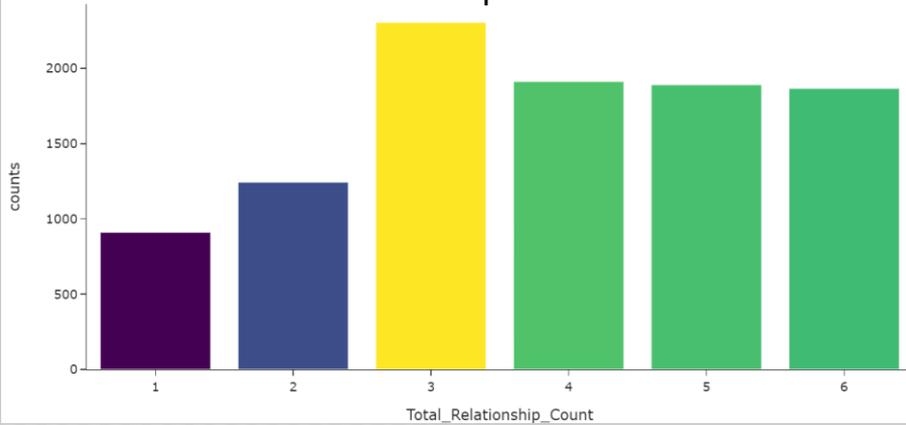


Dependent Count of Customers



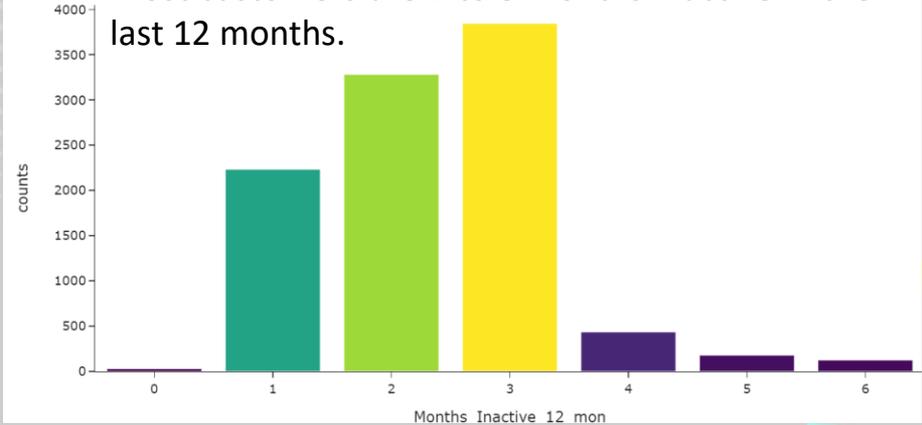
Total Number of Products held by Customers

Most customers have 3 products with the bank.



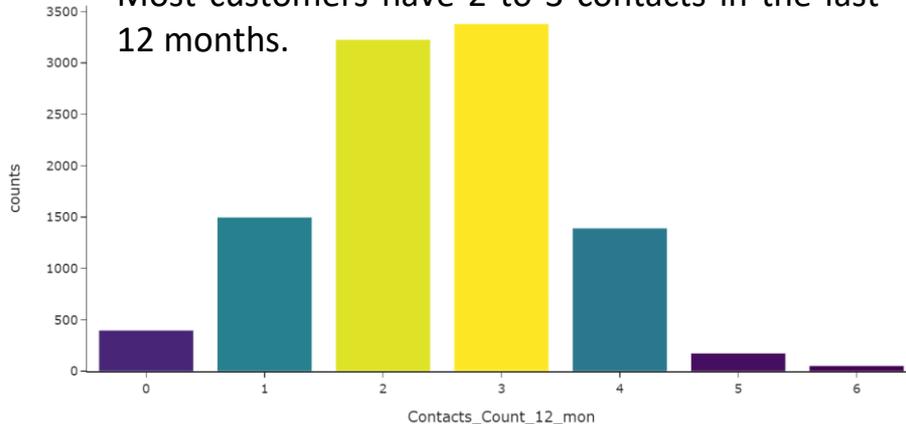
No. of months inactive in the last 12 months

Most customers are 2 to 3 months inactive in the last 12 months.



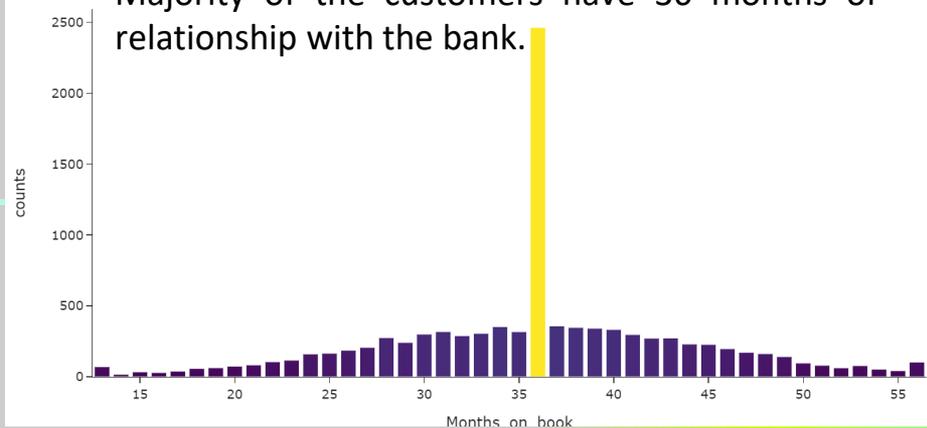
No. of Contacts in the last 12 months

Most customers have 2 to 3 contacts in the last 12 months.



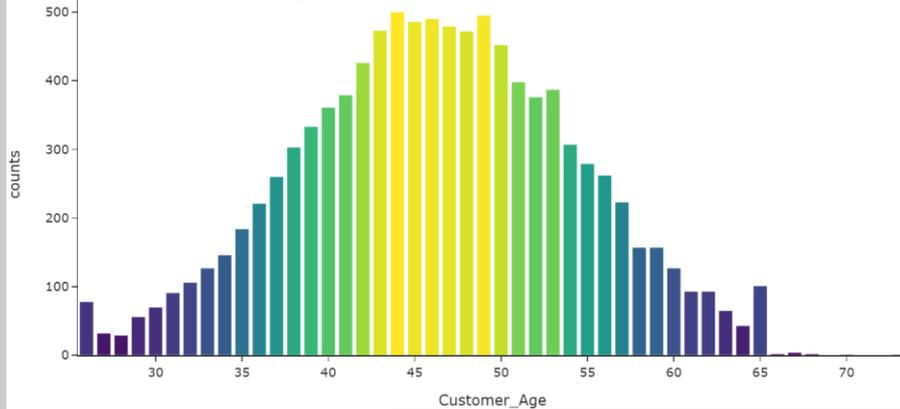
Period of Relationship with Bank

Majority of the customers have 36 months of relationship with the bank.



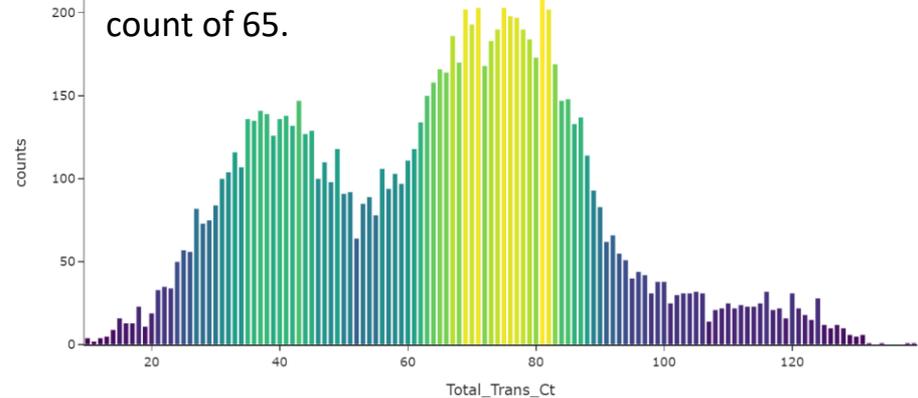
Total number of Customers with Unique Age Values

The mean age of our customers is 46.3 years old.



Total Transaction Count (Last 12 months)

Our customers have a total mean transaction count of 65.



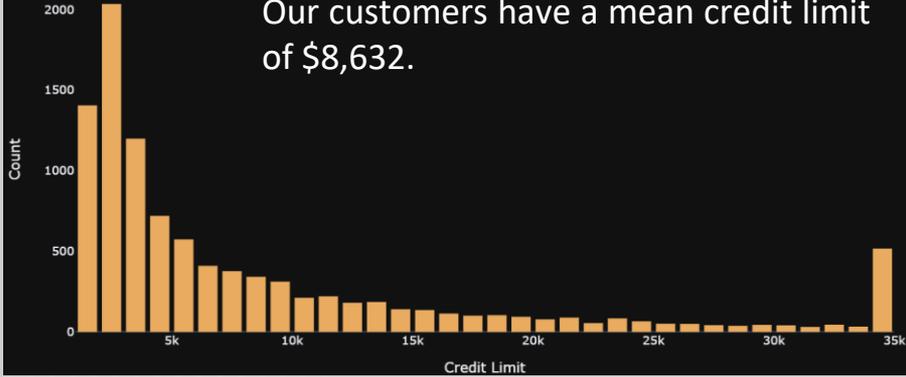
Total Transaction Amount

Our customers have a total mean transaction amount of \$4.4K.



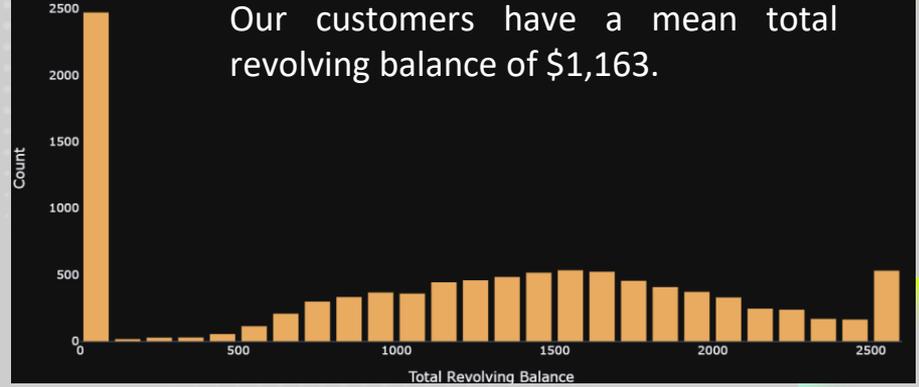
Credit Limit

Our customers have a mean credit limit of \$8,632.



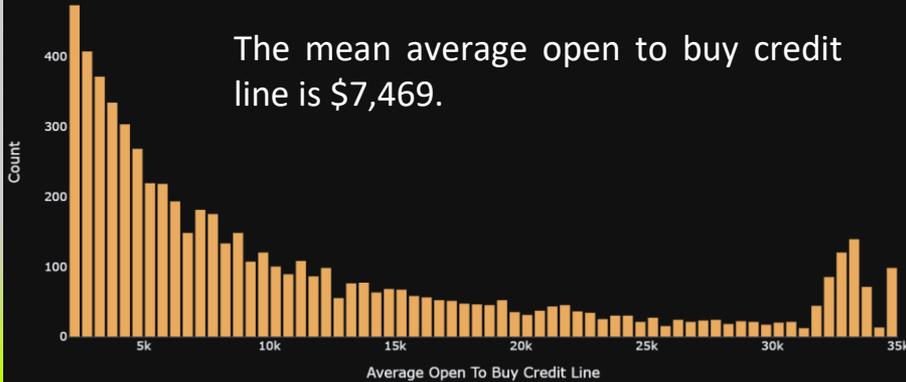
Total Revolving Balance

Our customers have a mean total revolving balance of \$1,163.



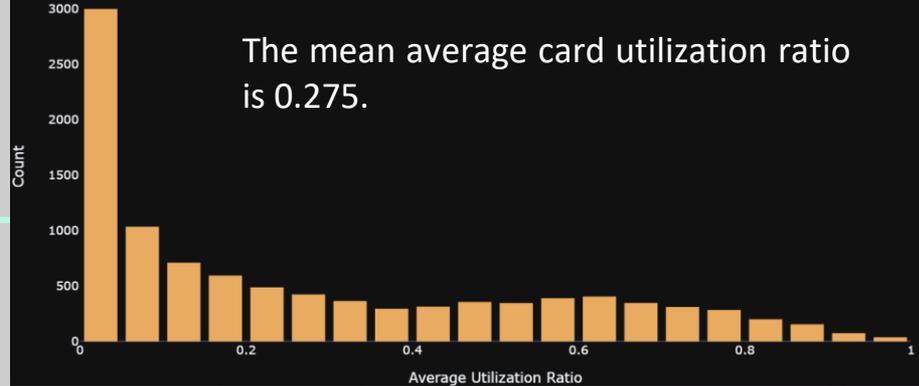
Average Open To Buy Credit Line

The mean average open to buy credit line is \$7,469.



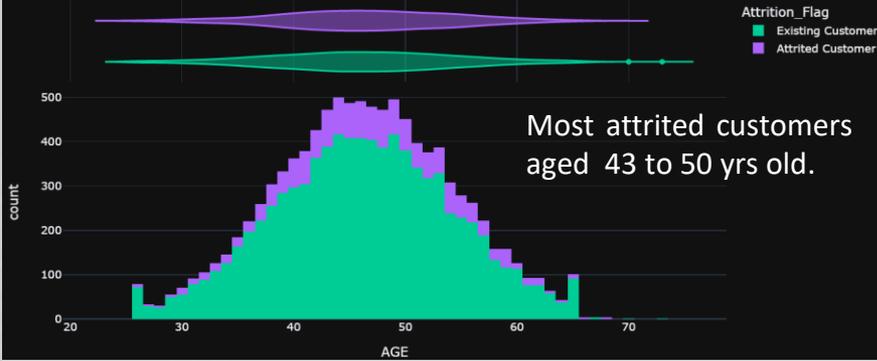
Average Utilization Ratio

The mean average card utilization ratio is 0.275.

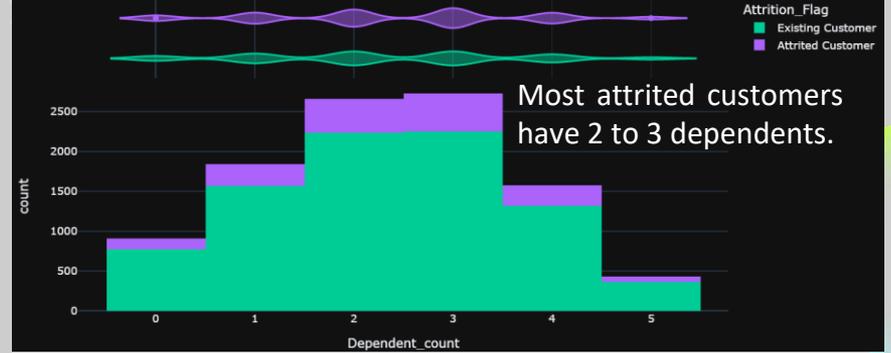


EXPLORATORY DATA ANALYSIS

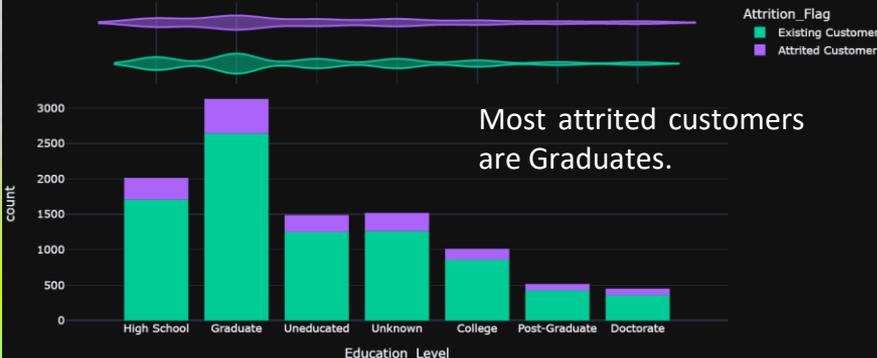
Distribution of Age vs Attrition Status



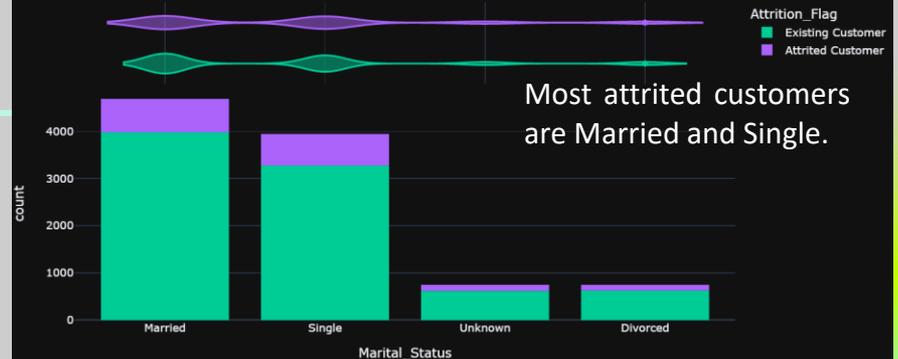
Distribution of Dependent Count vs Attrition Status



Distribution of Education Level vs Attrition Status

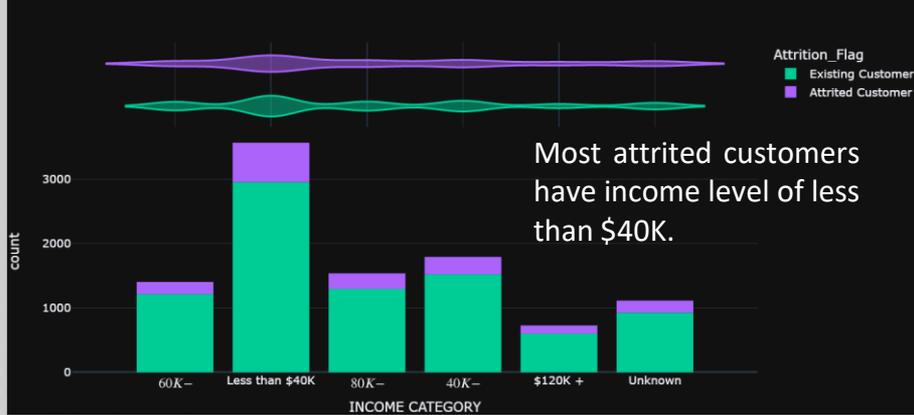


Distribution of Marital Status vs Attrition Status

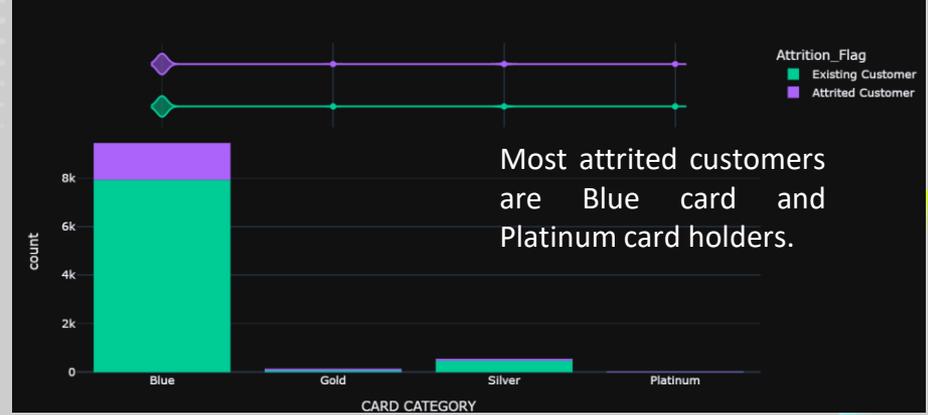


EXPLORATORY DATA ANALYSIS

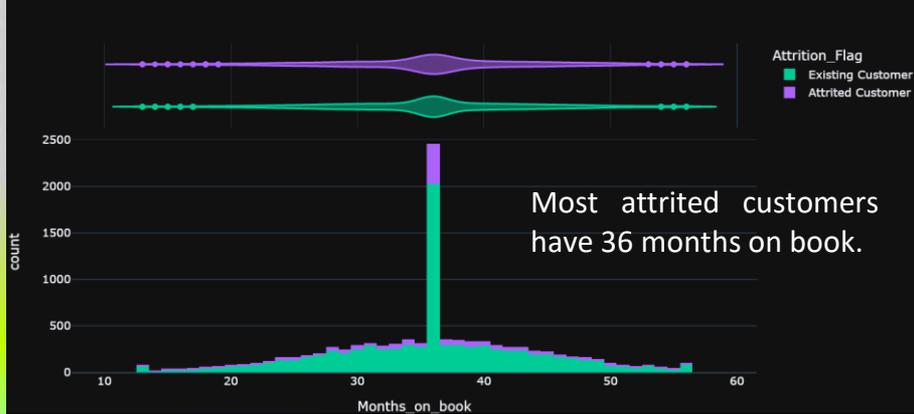
Distribution of Income Category vs Attrition Status



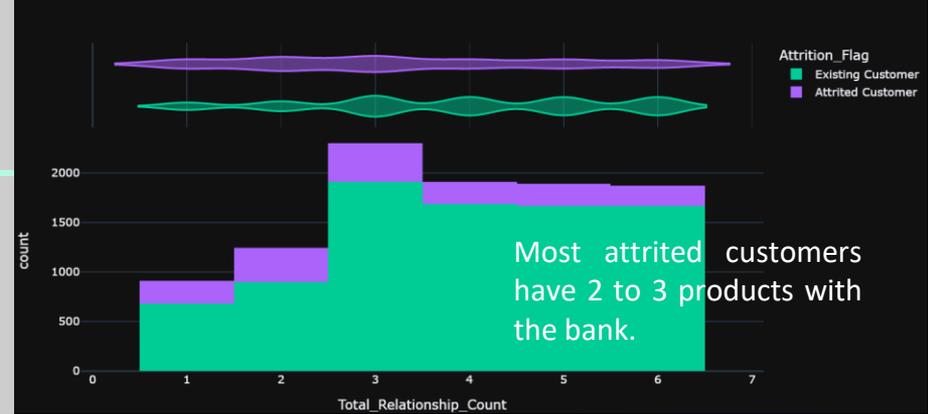
Distribution of Card Category vs Attrition Status



Distribution of Months on Book vs Attrition Status

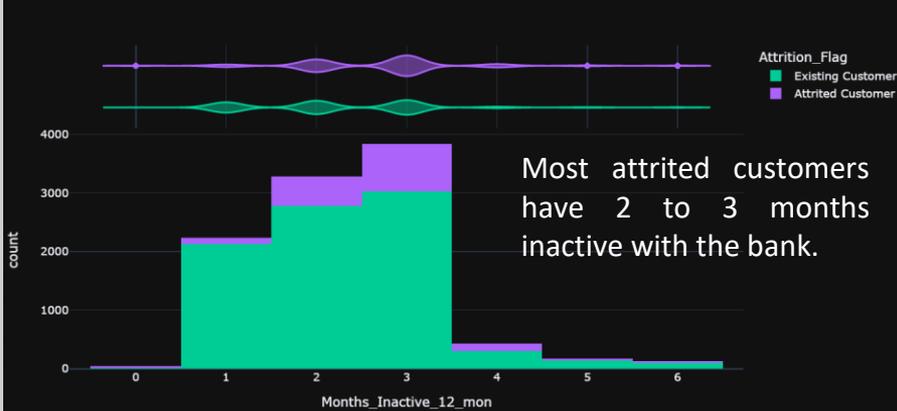


Distribution of Total Relationships Count vs Attrition Status

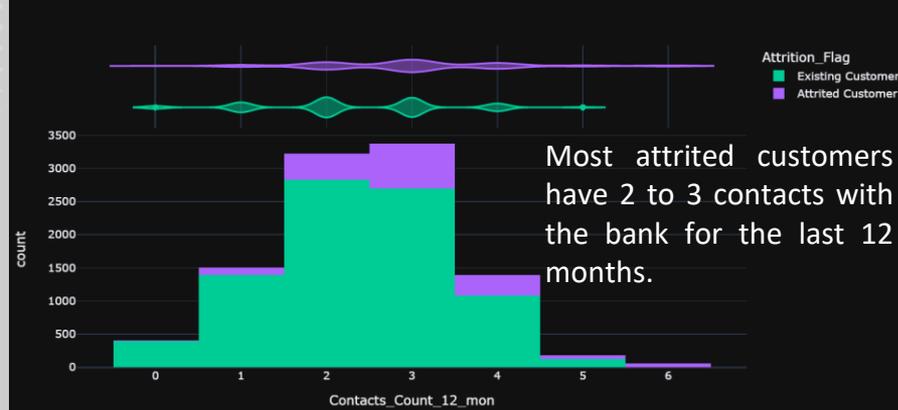


EXPLORATORY DATA ANALYSIS

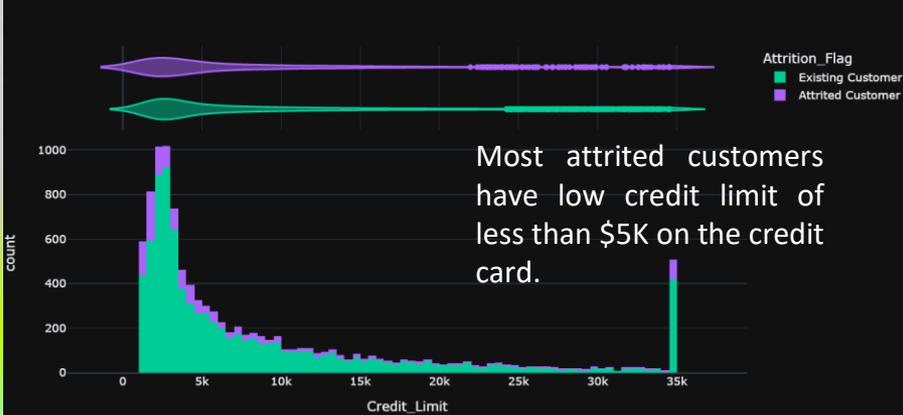
Distribution of Months Inactive vs Attrition Status



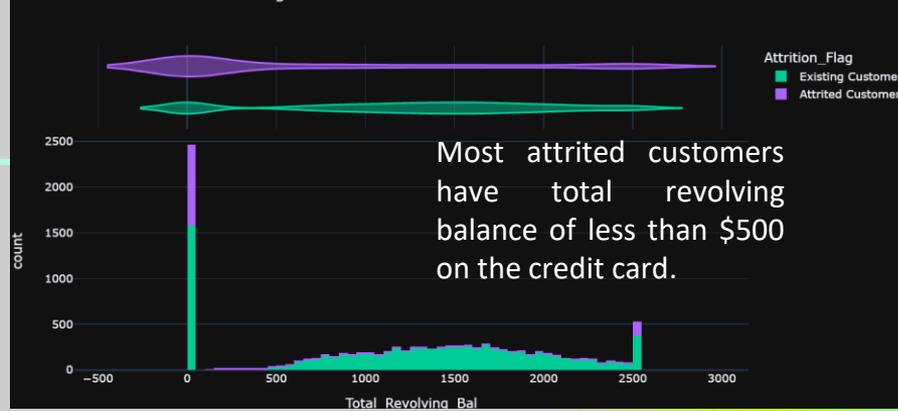
Distribution of Contacts Count vs Attrition Status



Distribution of Credit Limit vs Attrition Status

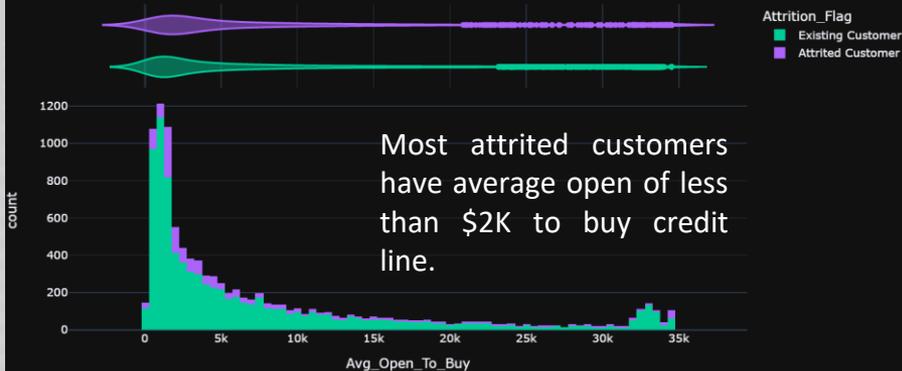


Distribution of Total Revolving Balance vs Attrition Status



EXPLORATORY DATA ANALYSIS

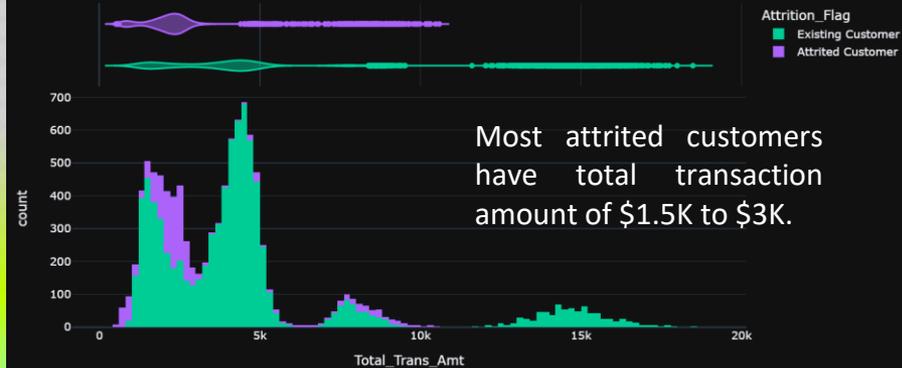
Distribution of Average Open to Buy vs Attrition Status



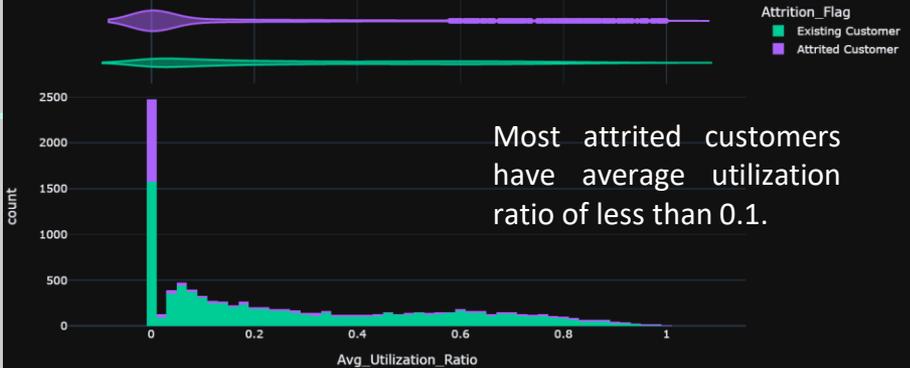
Distribution of Total Transaction Count vs Attrition Status



Distribution of Total Transaction Amount vs Attrition Status

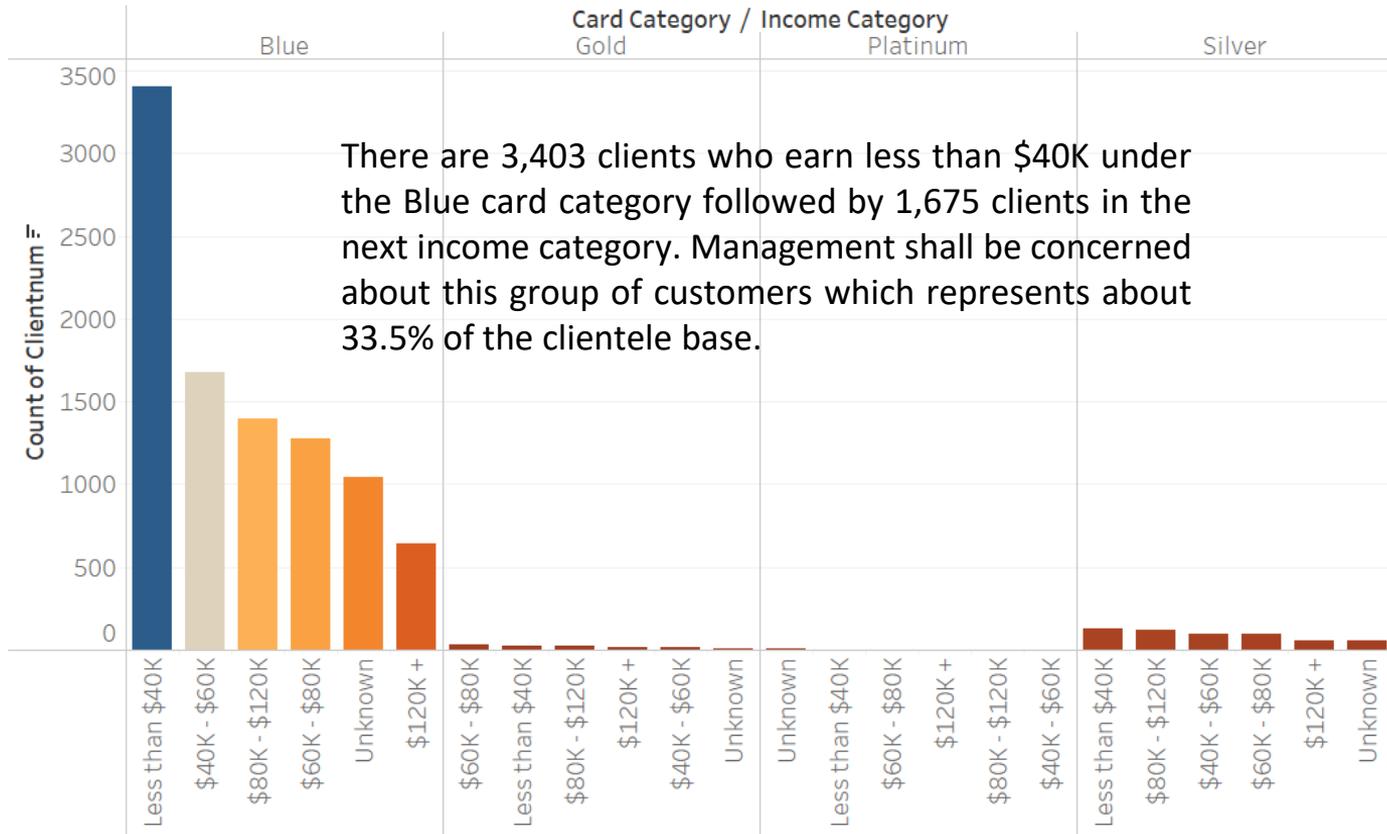


Distribution of Average Utilization Ratio vs Attrition Status



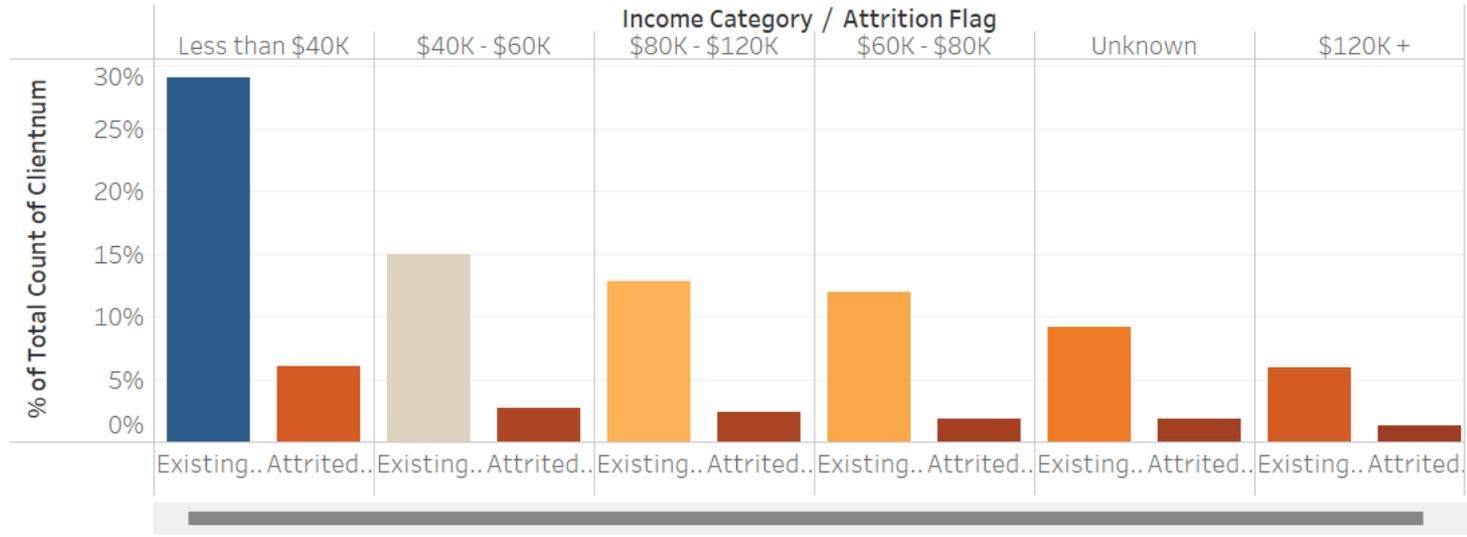
DATA INSIGHTS

Number of Clients vs Card Category / Income Category



DATA INSIGHTS

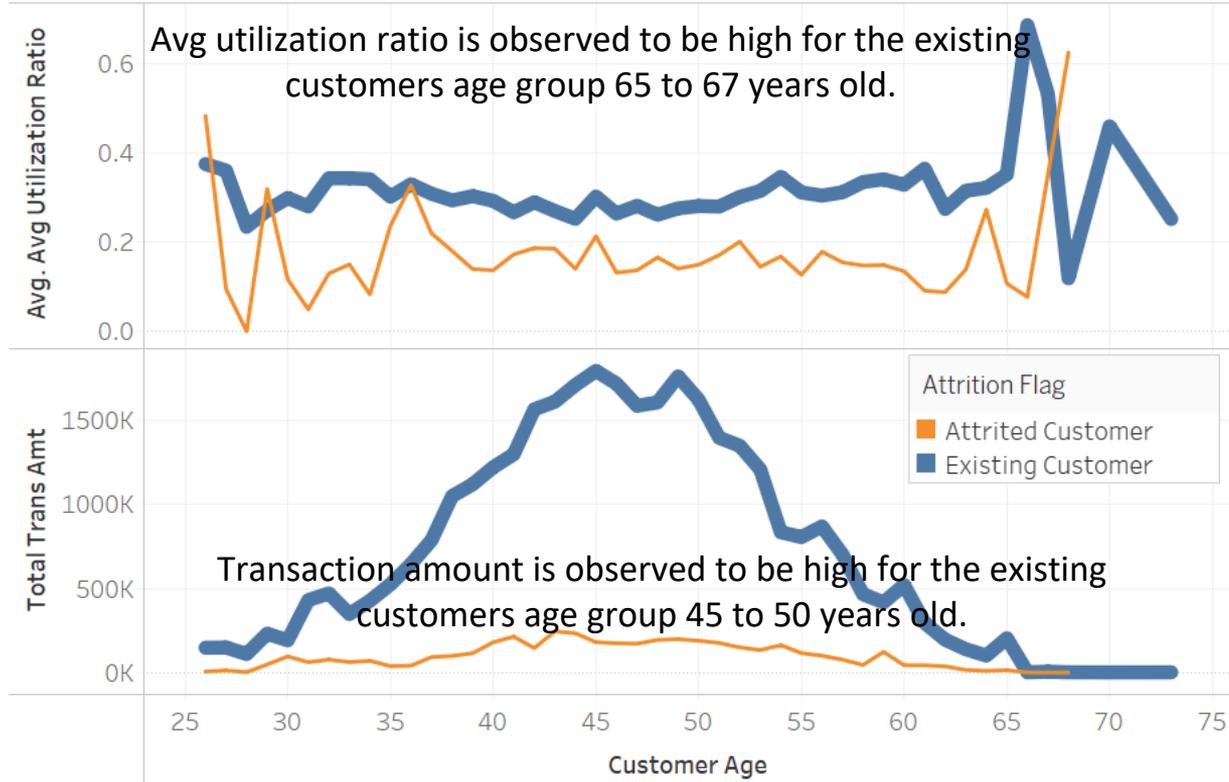
% of Clients vs Income Category / Attrition Flag



6% of the attrition rate comes from the customers in the lowest income category. Even though the attrition rate is consistent with the income level of the customers, Management can look into the various product and marketing strategies for each income level to better serve their customers as well as to reduce the attrition rate of the clientele base.

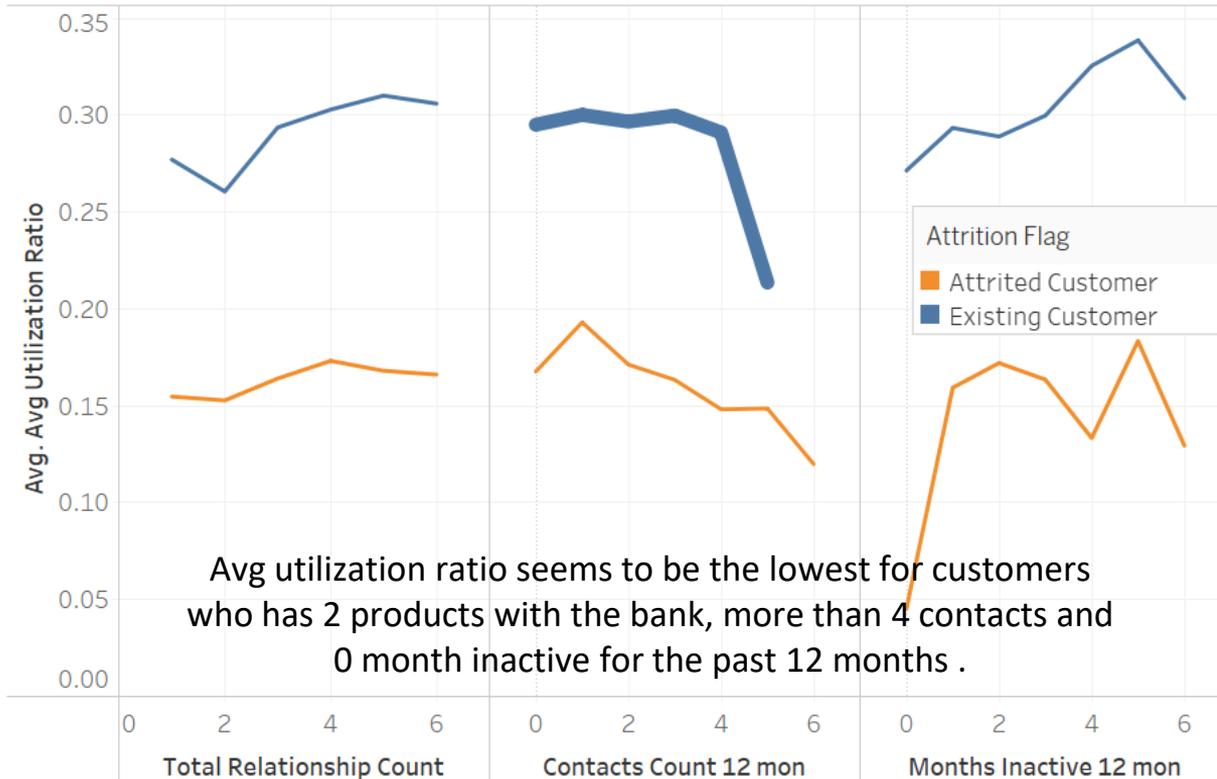
DATA INSIGHTS

Customer Age vs Avg Utilization Ratio and Total Transaction Amount



DATA INSIGHTS

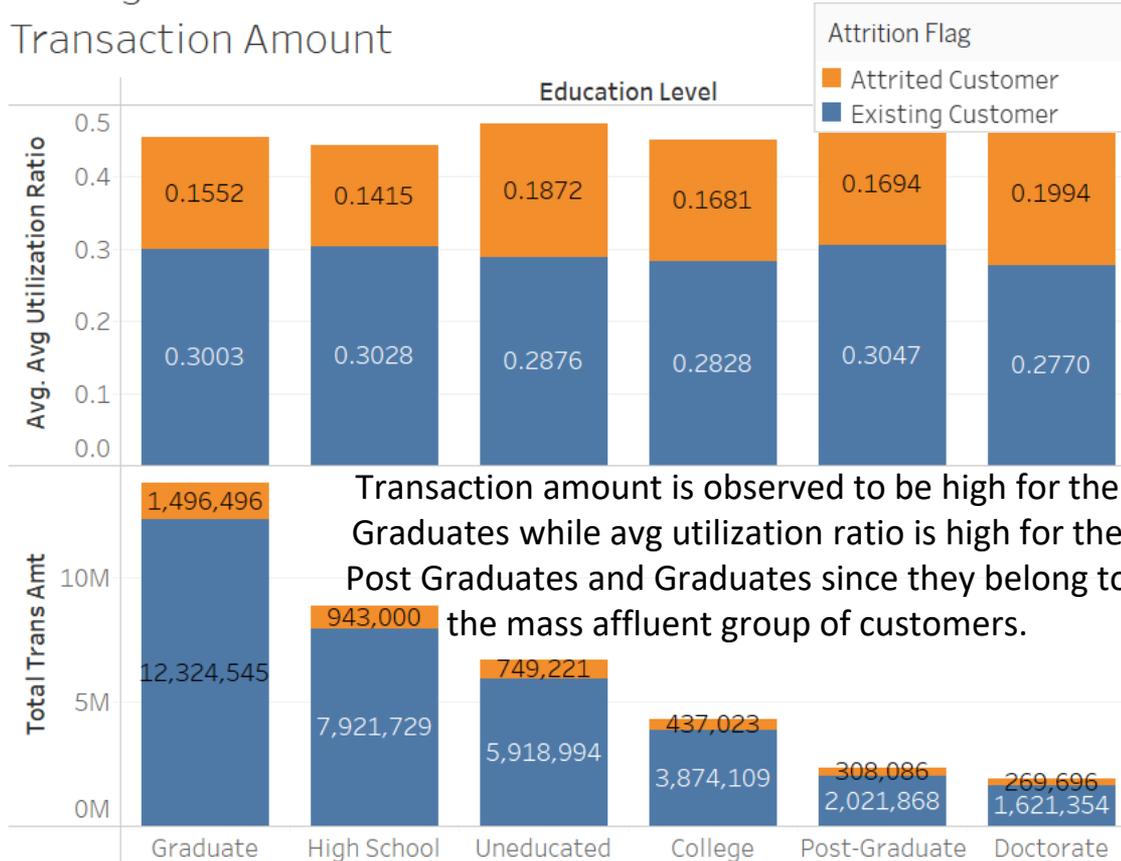
Average Utilization Ratio vs Total Relationship Count, Contacts Count and Months Inactive



Avg utilization ratio seems to be the lowest for customers who has 2 products with the bank, more than 4 contacts and 0 month inactive for the past 12 months .

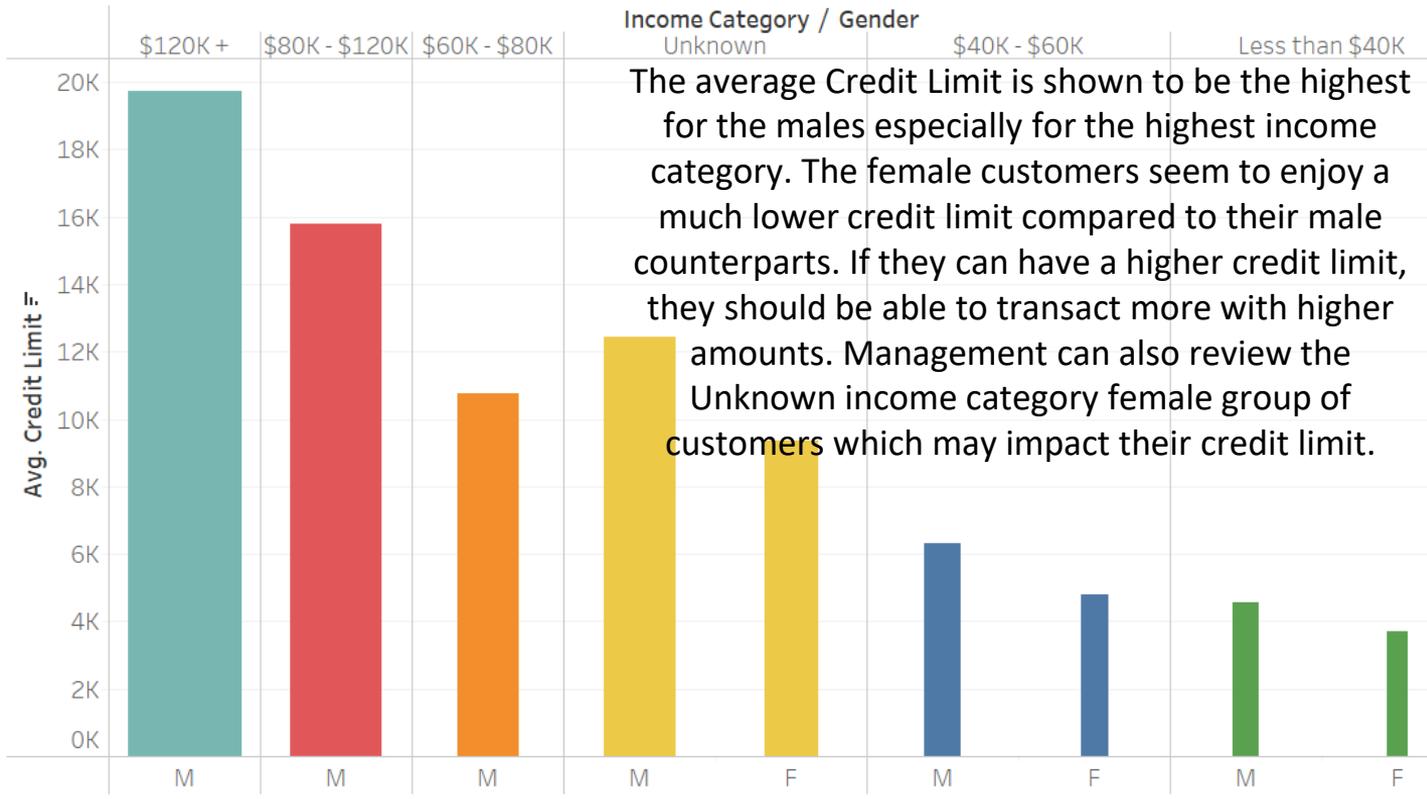
DATA INSIGHTS

Average Utilization Ratio vs Education Level and Total Transaction Amount



DATA INSIGHTS

Credit Limit vs Income Category / Gender



RECOMMENDATIONS

1. To focus on the high attrition rates of credit cards for the following characteristics of customers:

- Blue Card holders
- Age Group of 43 to 50 years old
- Marital Status (Married and Single)
- Education Level (Graduates and High School)
- Income Level of less than \$40K
- Number of dependents of 2 to 3
- 36 months of relationship with the bank
- Average of 3 products held by the customer
- Around 2 to 3 months inactive with the bank for the last 12 months
- Around 2 to 3 contacts for the last 12 months
- Low Credit Limit of approximately less than \$5K
- Total Revolving Balance of approximately less than \$500 on the credit card
- Average Open of approximately less than \$2K to buy Credit Line
- Approximate of 35 to 55 Transactions and Transaction Amounts of \$1.5K to \$3K
- Average Utilization Ratio of less than 0.1

RECOMMENDATIONS

2. To review the current product offerings to make them more attractive in order to increase the retention ratio of the existing customers and reduce the attrition rates of the outgoing customers.
3. To review and enhance their promotional marketing strategies for certain groups of customers especially the Blue Card and Platinum Card holders (affluent customers) which have the highest attrition rates.
4. To improve on the overall card benefits for the mass affluent card holders to better meet their expectations so that this group of customers would think twice before closing their accounts with the bank.
5. To find out the reasons as to why there are some “Unknown” entries under the ‘Income’ Category which will make data analytics more challenging since such dataset may be filtered out for analysis.
6. To review the existing credit limit for the females which are much lower compared to their male counterparts.
7. To conduct more market research on the more affluent customers to improve on the mean total transaction count as well as the mean total transaction amount.



THANK YOU!