Executive Summary

Business Problem: How can RappiCard predict and manage credit line utilization to optimize capital allocation and increase revenue

Objective: Develop robust occupation and risk assessment models to enhance financial stability and customer satisfaction.

Approach: Develop Credit limit and Risk models and use them as inputs for the Occupation model to optimally predict customer utilization rates.

- Occupation Model: Predict customer’s credit utilization after credit limit increase
- Risk Assessment Model: Identify suitable customers for credit limit increases based on risk score
- Credit Limit Model: Predict account limit for each customer

Impact: Influence credit strategies, risk management, and targeted marketing, directly enhancing satisfaction and stability.

Machine Learning Techniques Used:

- Linear & Logistic Regression
- Random Forest
- Neural Network
- Extreme Gradient Boosting (XGB)

Business Problem

Company Overview:

- Founded in 2015, Rappi is a leading on-demand delivery platform in Latin America, headquartered in Colombia, with a significant presence in Mexico.
- Launched in partnership with Visa, RappiCard is a credit card solution by RappiPay, specifically designed to offer great rewards, cashback, and excellent customer service to its users in Mexico.
- Competitors: Nubank, Mercado Pago.
- Sponsor: Carlos Otiz, Division: Data Science

Business Problem:

- Optimized Capital Allocation: Optimize capital reserves by understanding credit utilization for users
  - Enhanced Customer Insight: Understand how different customer segments use credit lines to tailor products
  - Strategic Risk Management: Enhance risk management strategies to reduce bad debt exposure
  - Dynamic Credit Limits: Implement a system for dynamic adjustment of credit limits

Data Description

Utilization Model Data

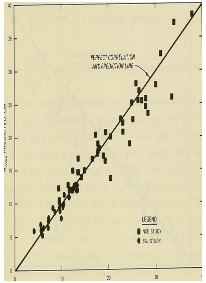
Raw Data Overview

- Data Span: January 2023 to December 2023
- Granularity: Monthly data for each customer
- Depth of Data: Up to 12 records per customer
- Number of Observations - 1718976
- Number of Features - 73
- Number of Unique Customer - 200936
- Customers with 6+ months of active status = ~84%
- Customers with Credit Limit Change = ~24% of 84%

Distribution of Credit Limit Change (6+ Months of Active Status)

Change Type	Count	Avg Amount Change
Increase in Credit Limit	39211	3490.178776
Decrease in Credit Limit	1576	7621.256345
No Change	128710	

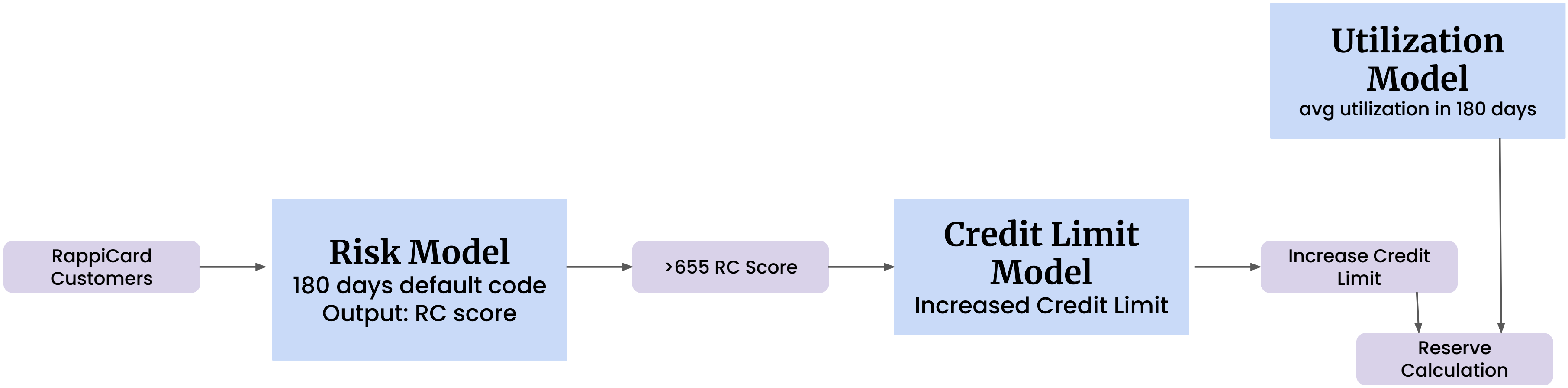
Expected Deliverable



Prediction Model	• Utilization Model : Utilization Average after the credit limit increase • Risk Model : Probability of Default at 180 days after the credit limit increase • Credit Limit Model : Amount of Credit Line Increase
Performance Metrics	• Risk Model : R^2, AUC • Credit Limit Model : : R^2, MAE • Utilization Model : R^2, RMSE
Business Insight	• Cost : Expected Loss (= Reserve) • Benefit : Revenue (Revolving interest)

Detailed Report and All the notebooks will be delivered

Solution Path

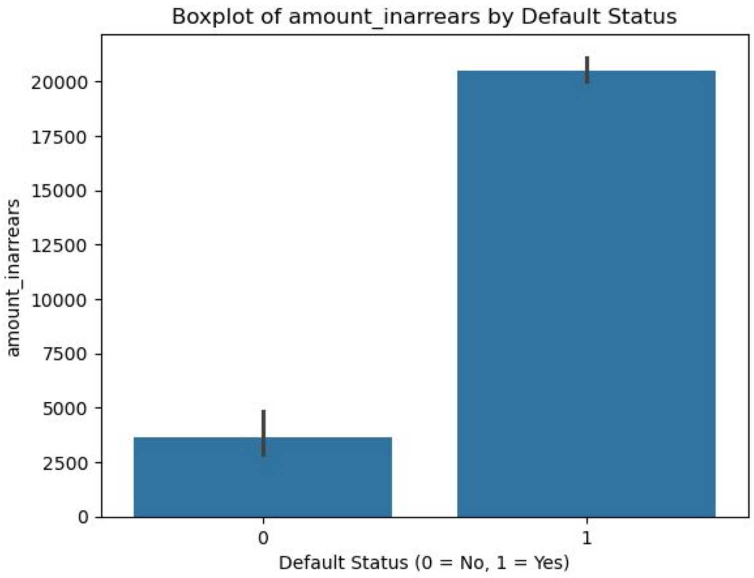


- **Credit Reserve (or Reserve Balance)**: This is a portion of your available credit that is set aside by the credit card issuer to cover potential future charges, disputes, or other contingencies.
- **Reserve** = Exposure at Default * Probability of Default * Loss given Default

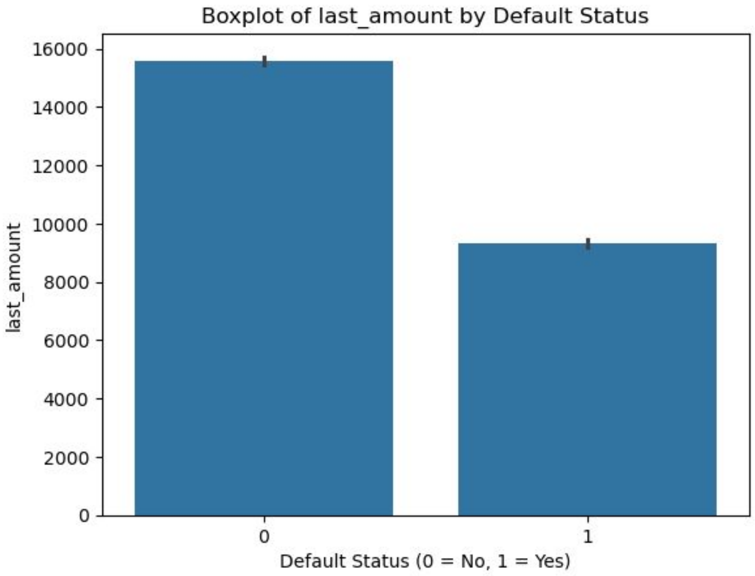
Results and Recommendations

Risk Model – Bivariate Analysis

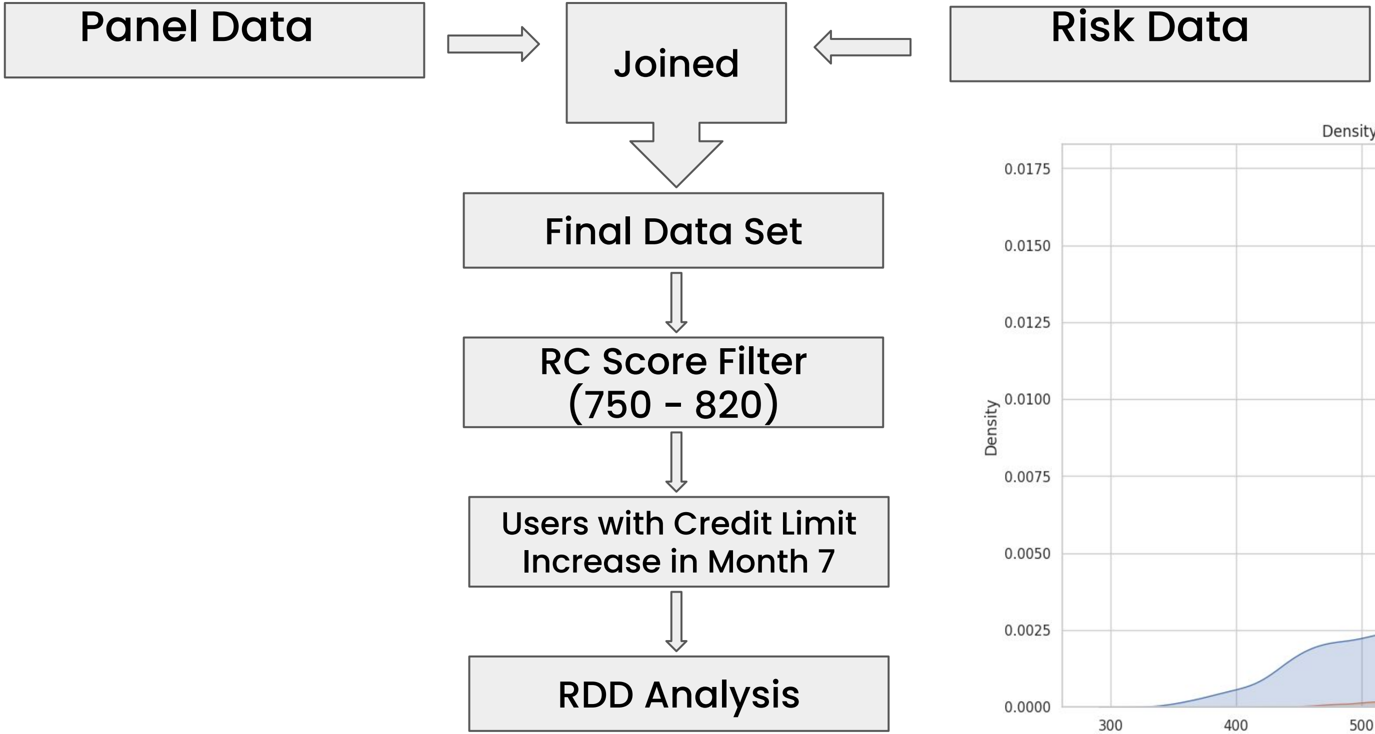
- Amount In Arrears

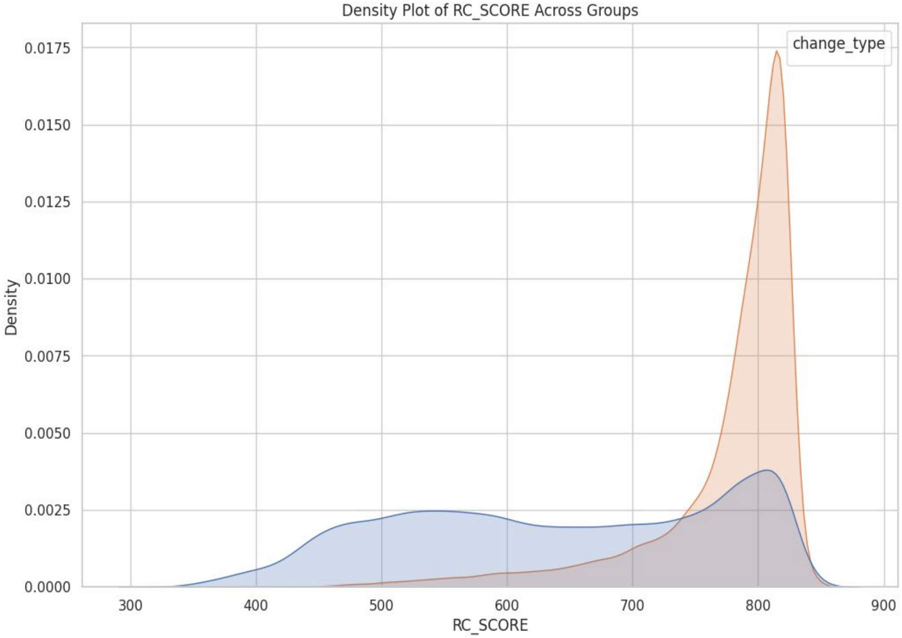


- Last Amount



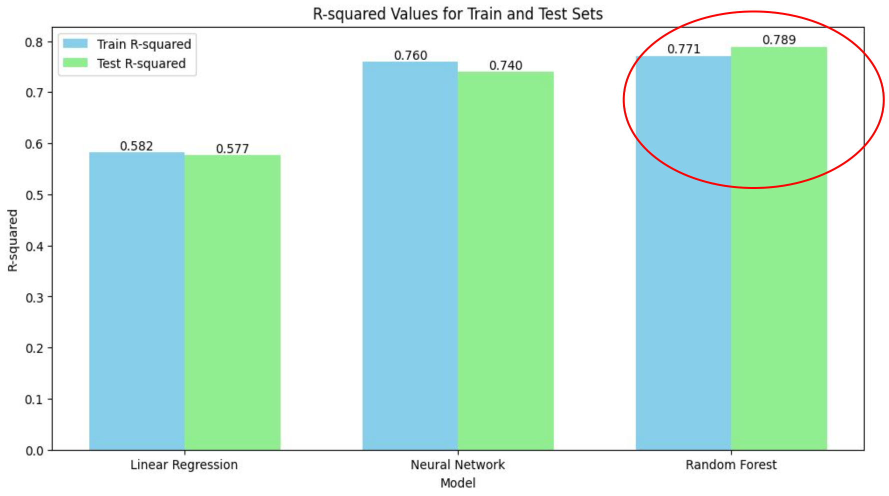
RDD - DataSet Creation

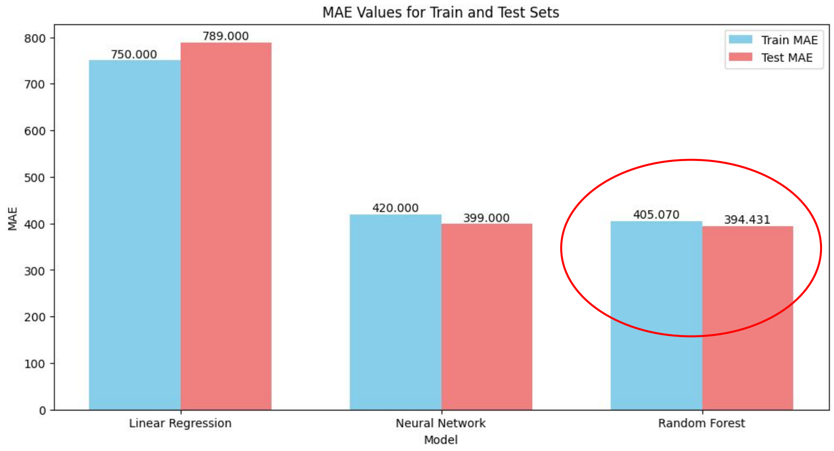




Orange area - With change in account limit
Blue area - Without change in account limit

Metrics Comparison





Random Forest model appears to be the best choice

- High explanatory power (highest R-squared values)
- High prediction accuracy (low MAE values)
- Good generalization (small difference between train and test R-squared values).

Utilization Model - process

Feature Engineering - min,max,mean for numericals and sum for one hot encoded categoricals(non-payment-code)

Feature Selection

Data Split - train:test = 8:2

Modeling : Linear regression, XGB, RF, NN

Revenue Calculation

Interest Income	+	Transactional Income	–	Financial Cost	–	Transactional Expense
Revolving Interest		Exchange Fee ATM Fee Markup Fee		Reserve		Transaction Fee Banking Fee ATM Fee

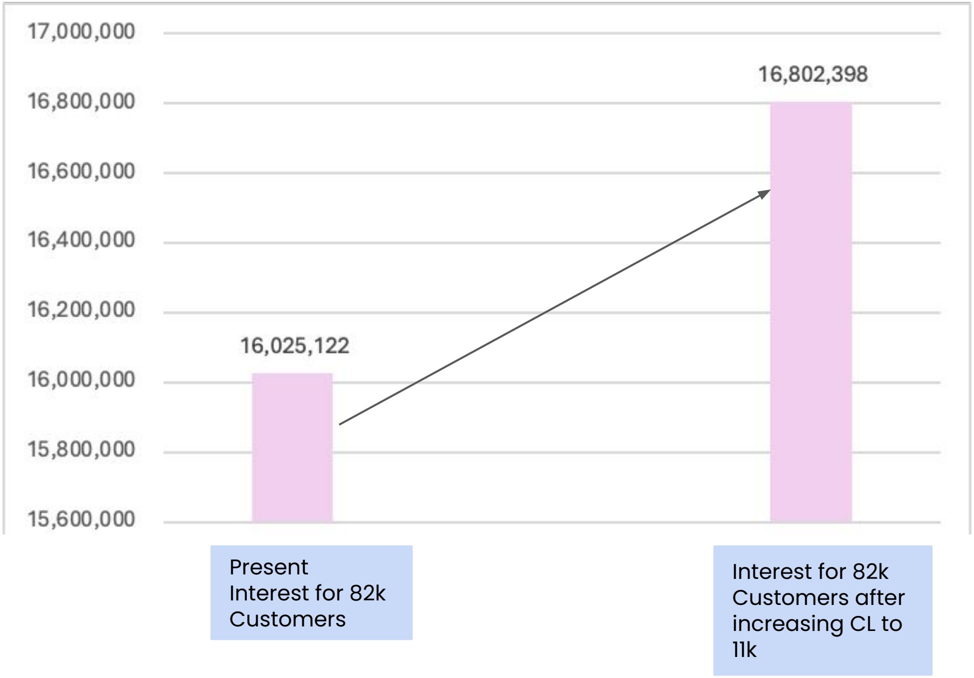
Additional Revolving Interest

Reserve = TE * PD * LGD

TE- Total Exposure(Utilization Amount)
PD - Probability of Default
LGD -Loss Given Default

Total Customers = 11802
Sum of CL = 255 M
Sum of Utilization = 73 M
Avg Probability of Default = 0.62 %

Reserve = 2.8 M



Additional Revolving Interest = 777,277 from 11k Customers