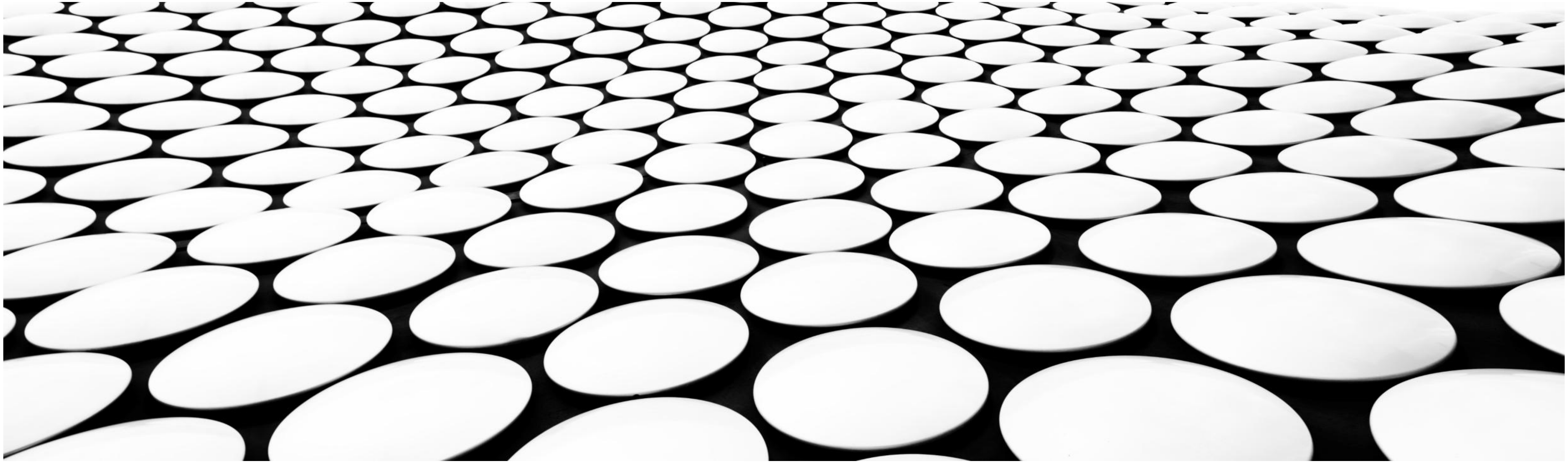
E-Commerce and Retail B2B Case Study

SUBMITTED BY

K R K PRASANNA KUMAR

INDRANI SONAR

ABHINAV



PROBLEM STATEMENT & GOALS

- **Problem Statement:**
  - Schuster, a multinational retail company, deals with vendors having credit arrangements.
  - Some vendors make late payments, causing financial impact and inefficiency.
  - Employees spend time chasing payments, leading to non-value-added activities.
  - Schuster wants to understand payment behavior and predict late payments.
- **Goals:**
  - **Analyze Payment Behavior**: Segment customers based on past payment patterns.
  - **Predict Late Payments**: Use historical data to predict delayed payments on open invoices.
  - **Improve Collection Efficiency**: Help collectors prioritize vendors for timely payment.
  - **Develop a Model:** Identify key factors influencing late payments and recommend a classification model for production deployment.

PROBLEM APPROACH

1.Start

2.Data Reading and Understanding

3.EDA

4.Feature Engineering

5.K- Means Clustering

6.Model Building

7.Feature Tuning

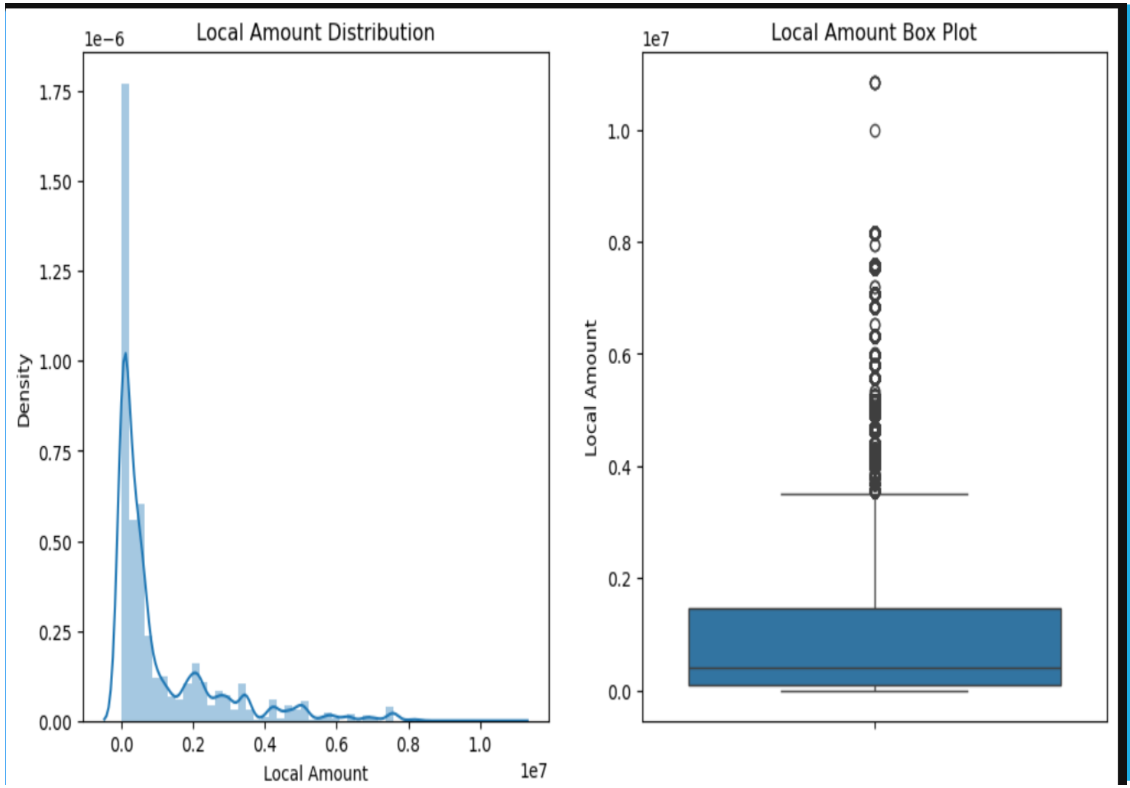
8.Model Testing

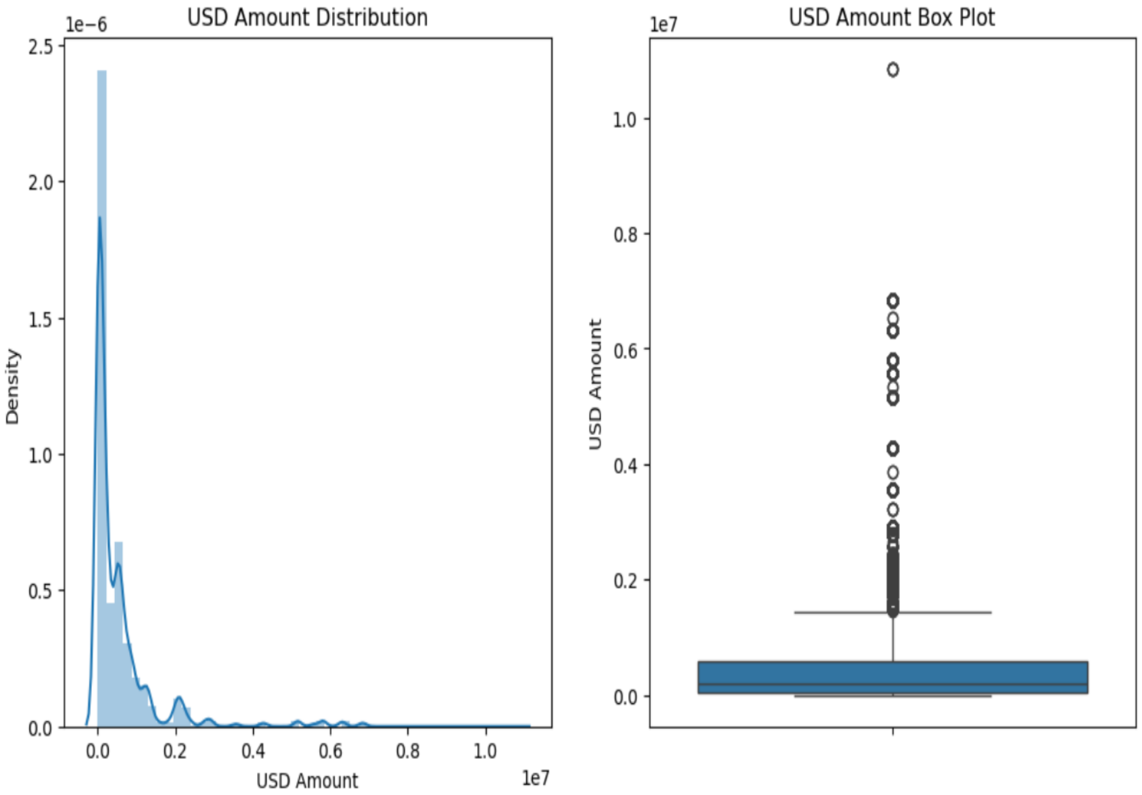
9.Model Finalization

10.Predicting & Recommendations

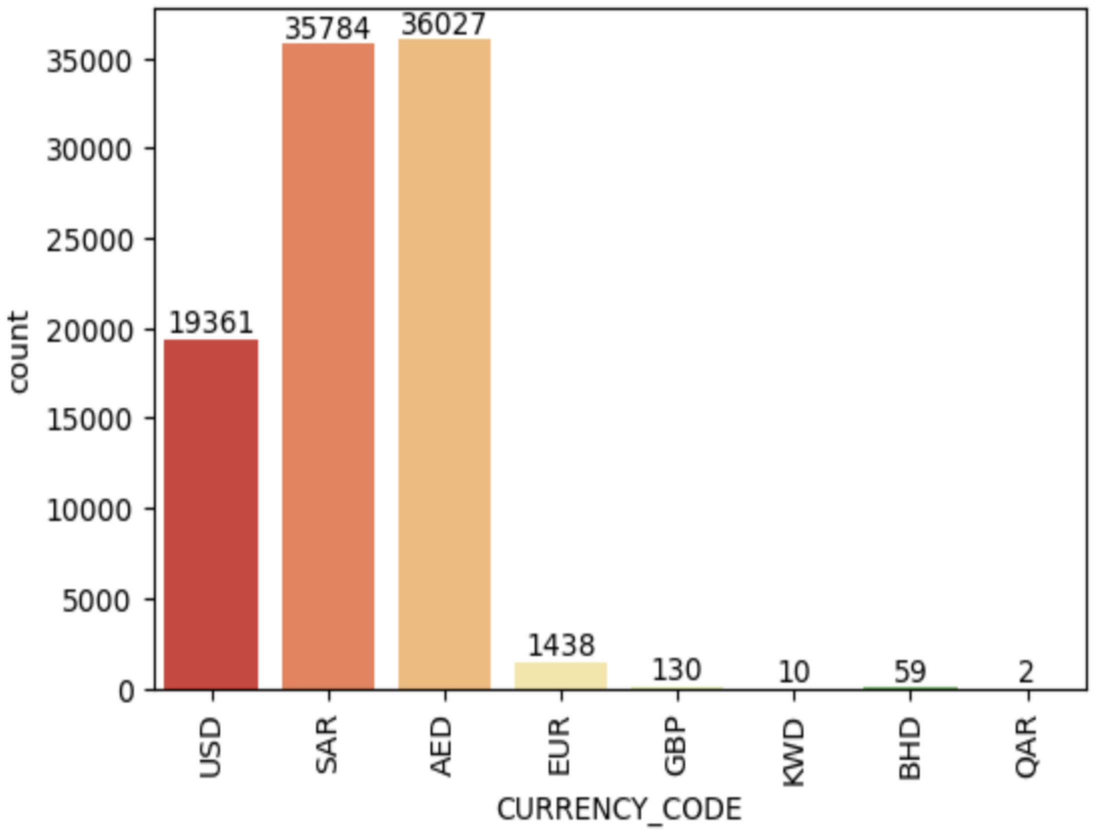
11.End

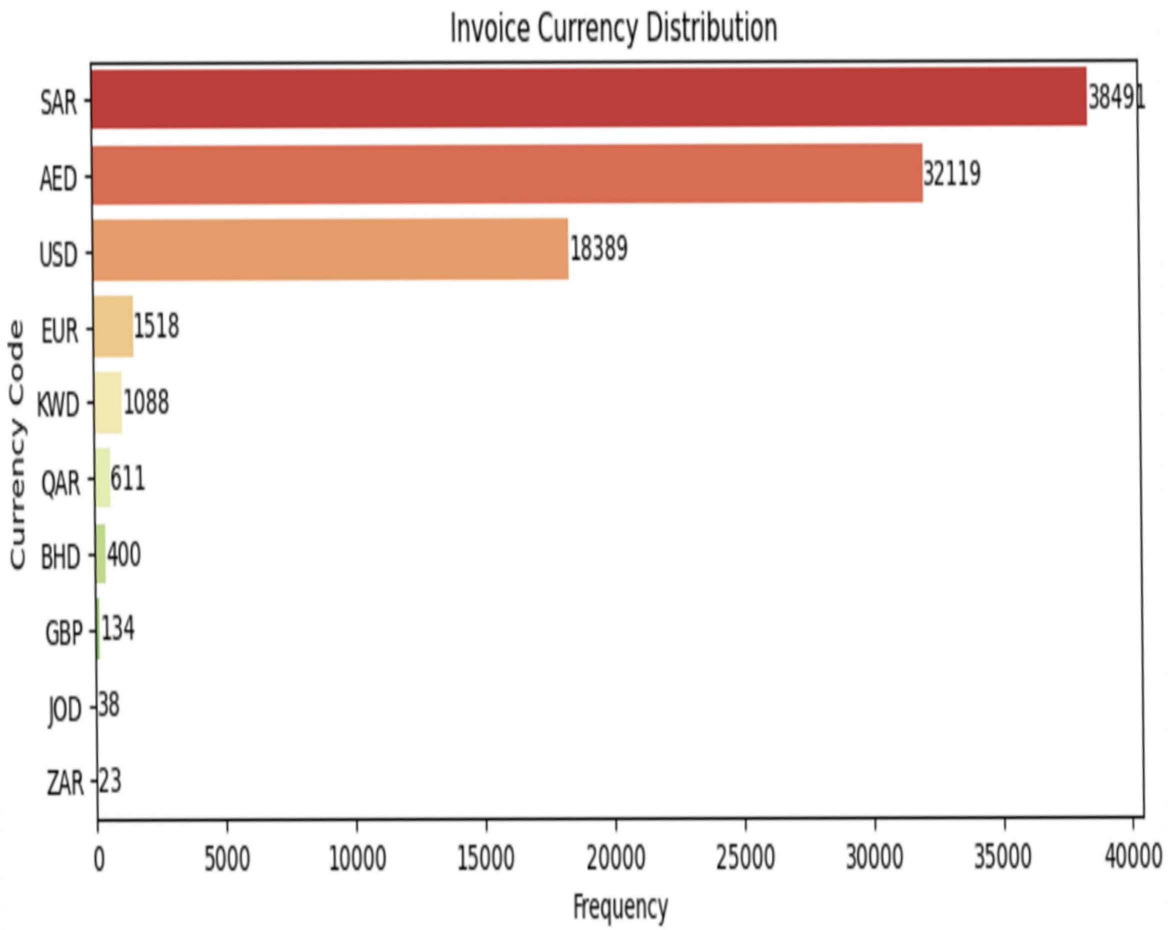
LOCAL AMOUNT & USD



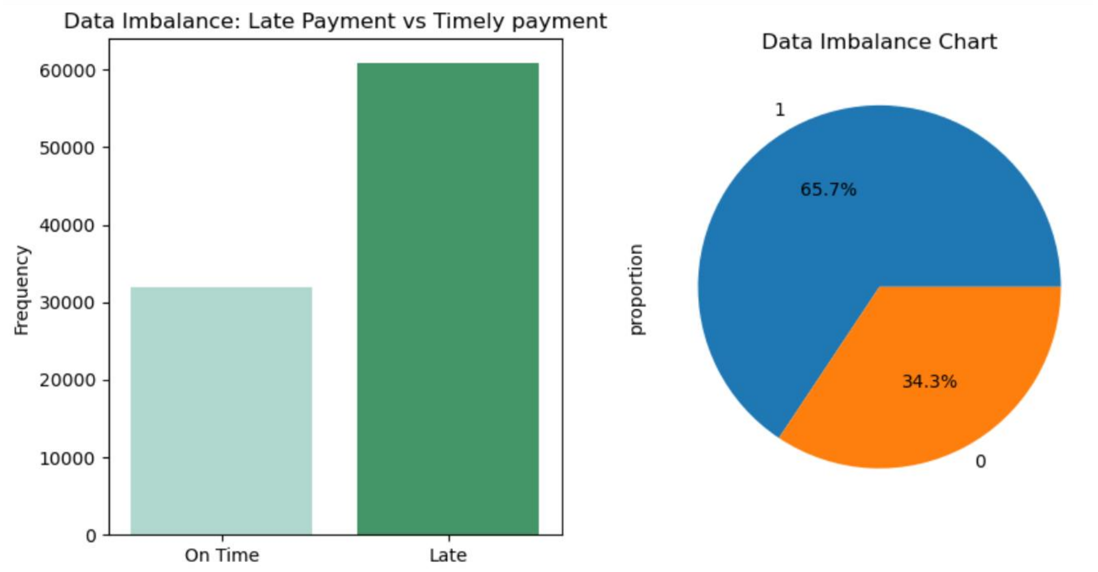


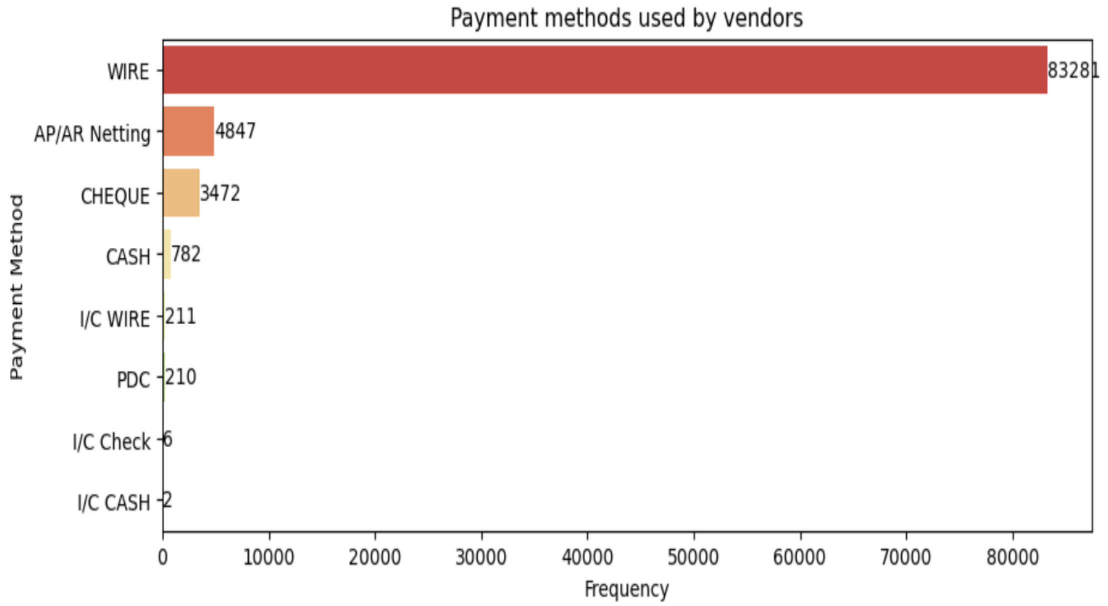
CURRENCY COUNT AND INVOICE DISTRIBUTION



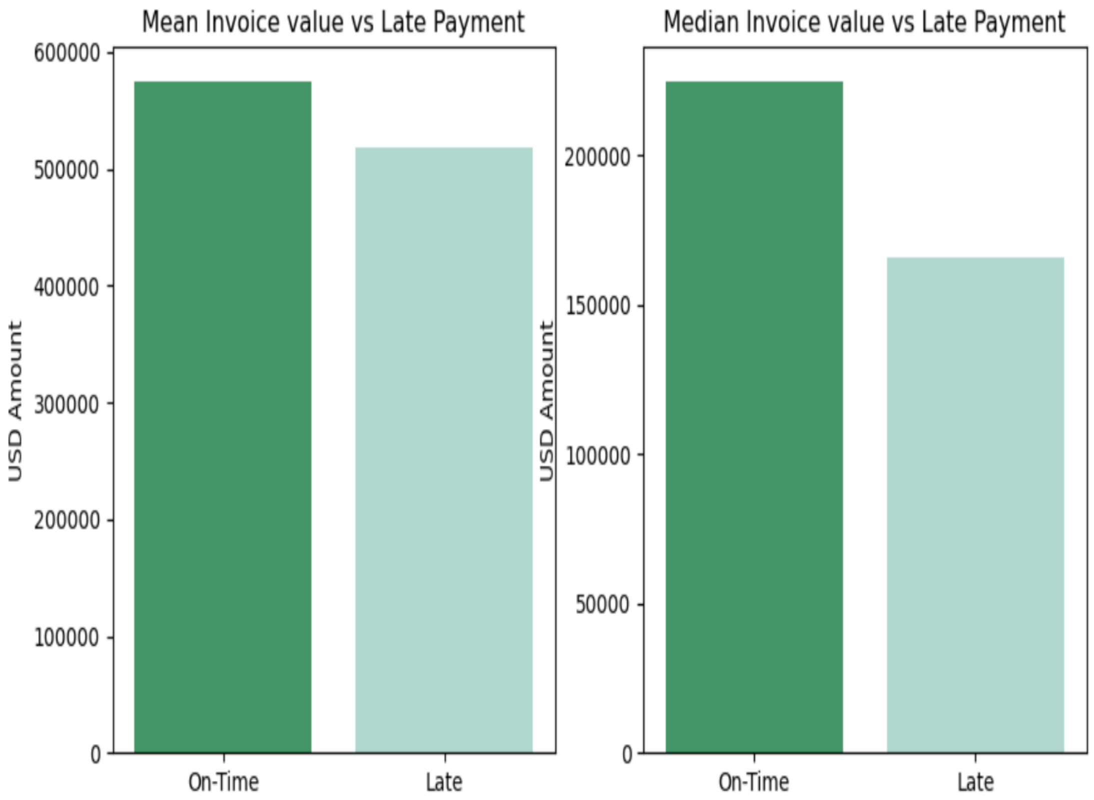


DATA IMBALANCE & PAYMENT METHOD





USD ONTIME AND LATE PAYMENT COMPARISON



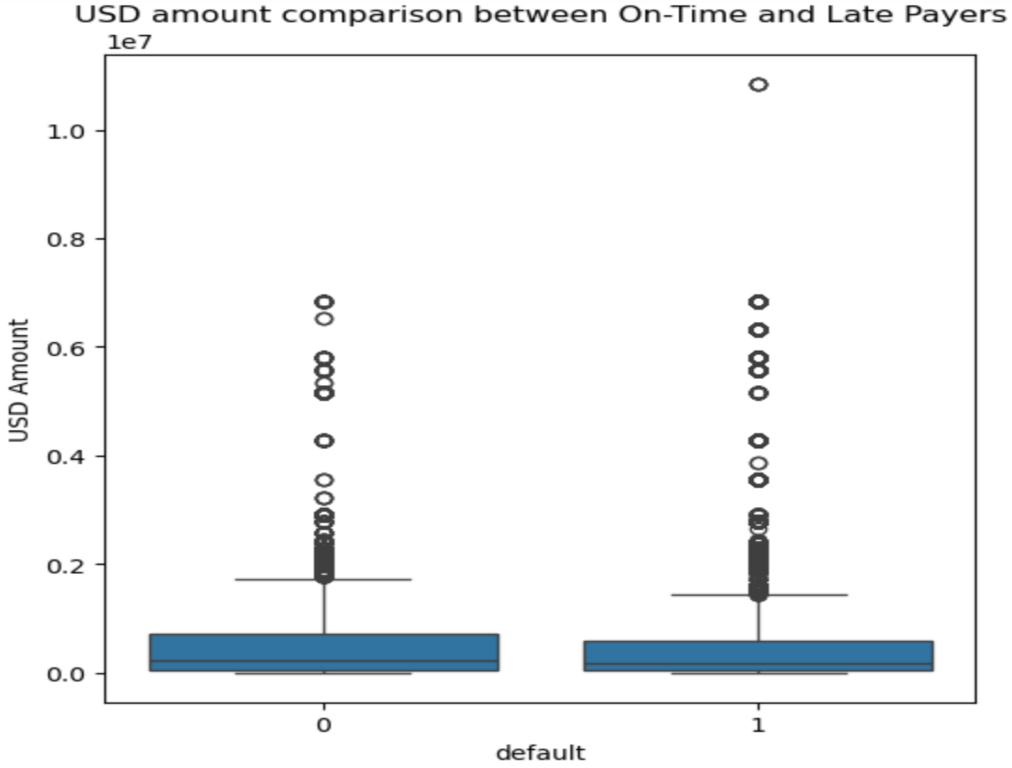
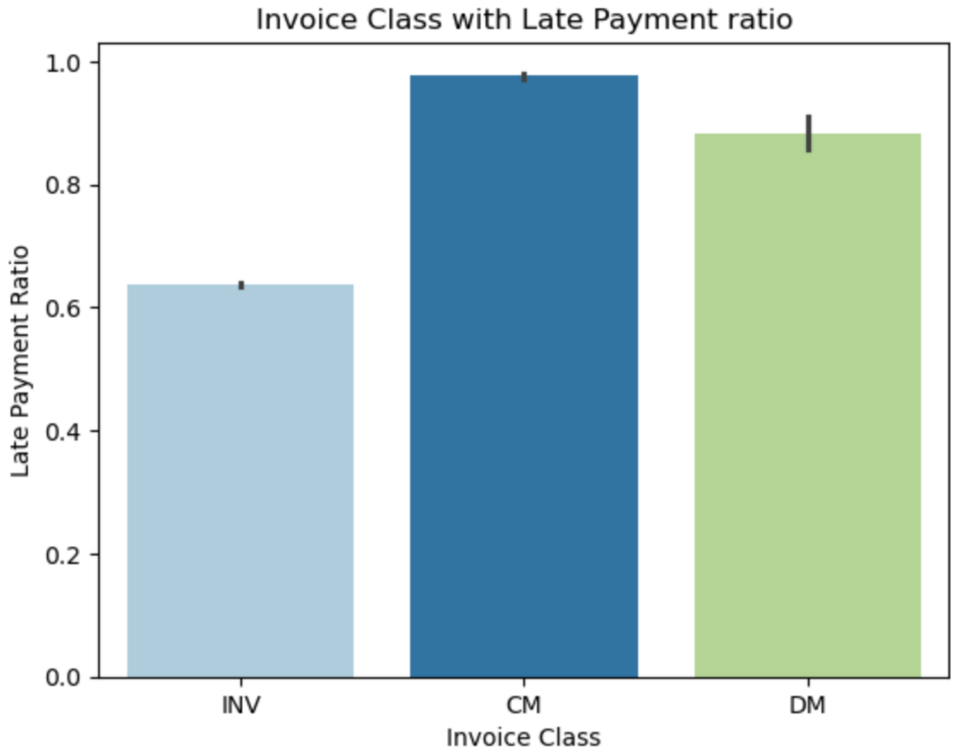
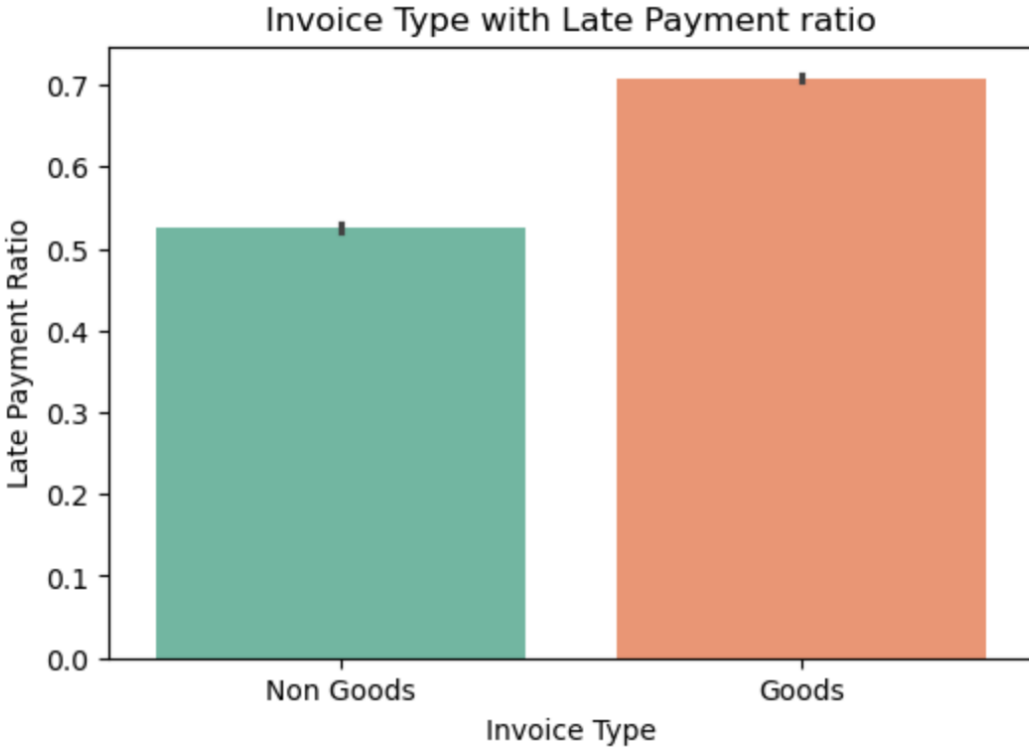


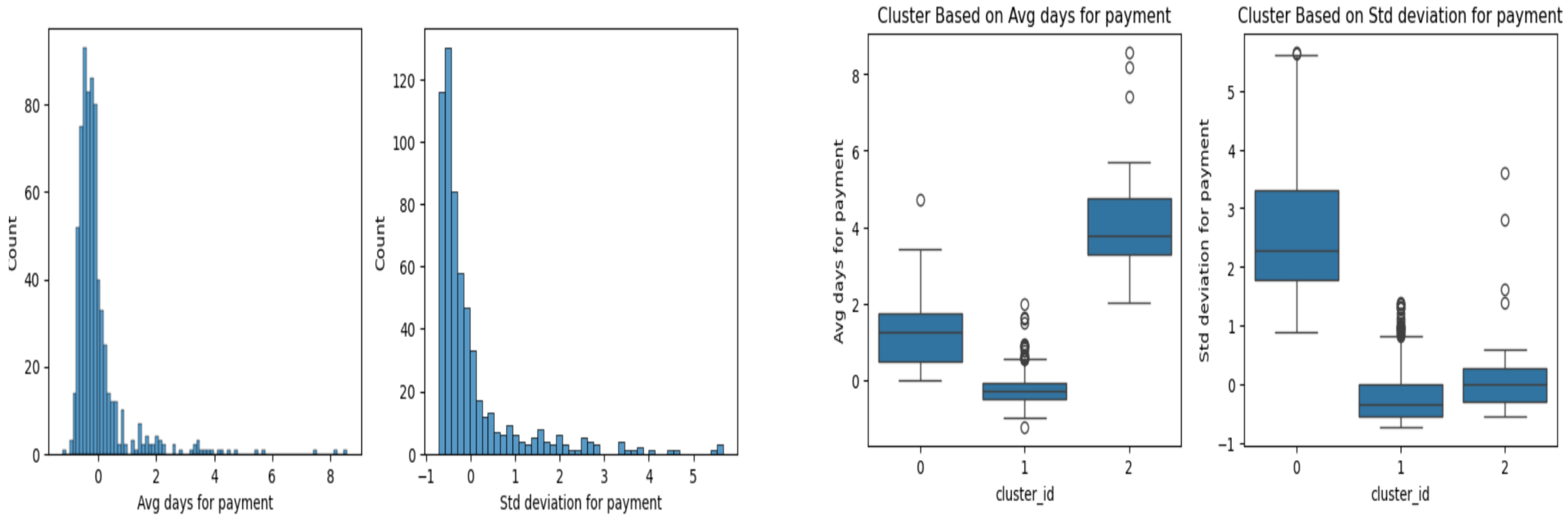
FIG 1 : THE LATE PAYMENT RATIO IS HIGHEST FOR CREDIT NOTE TRANSACTIONS, FOLLOWED BY DEBIT NOTE AND INVOICE, INDICATING THAT CREDIT AND DEBIT NOTE TRANSACTION TYPES CARRY A HIGHER RISK OF PAYMENT DELAYS

FIG 2 :GOODS-TYPE INVOICES EXHIBIT A HIGHER LATE PAYMENT RATIO COMPARED TO NON-GOODS INVOICES, INDICATING AN INCREASED LIKELIHOOD OF PAYMENT DELAYS FOR GOODS-RELATED TRANSACTIONS.

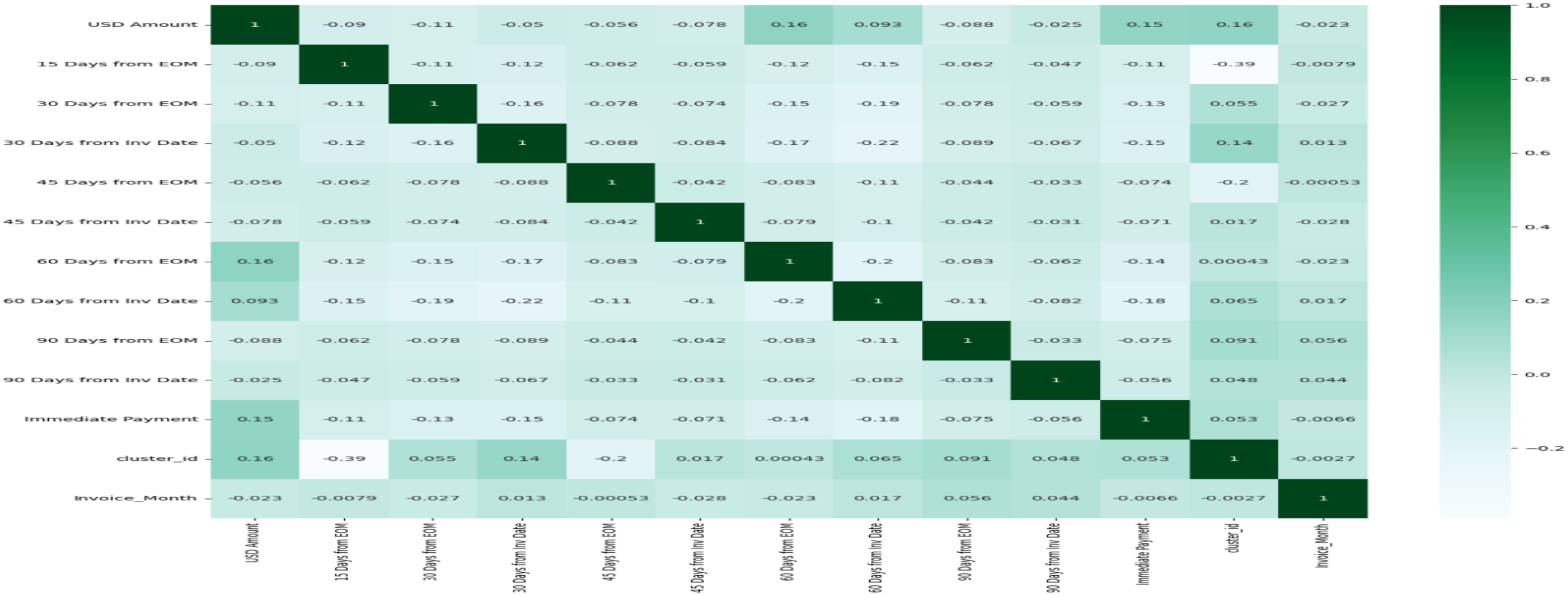




AVG DAYS & STANDARD DEVIATION OF PAYMENTS

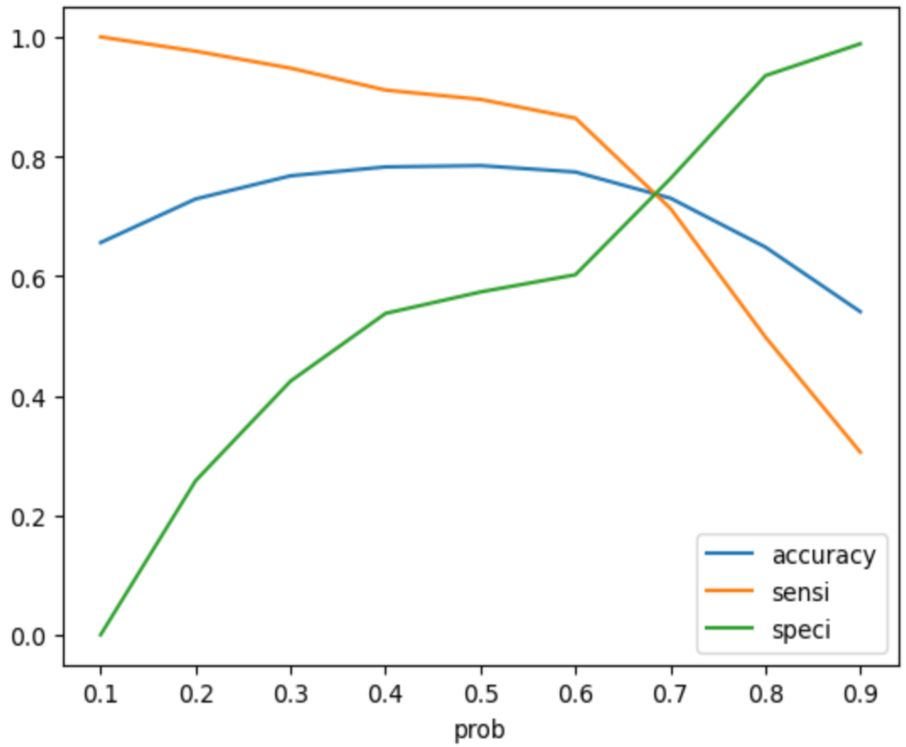


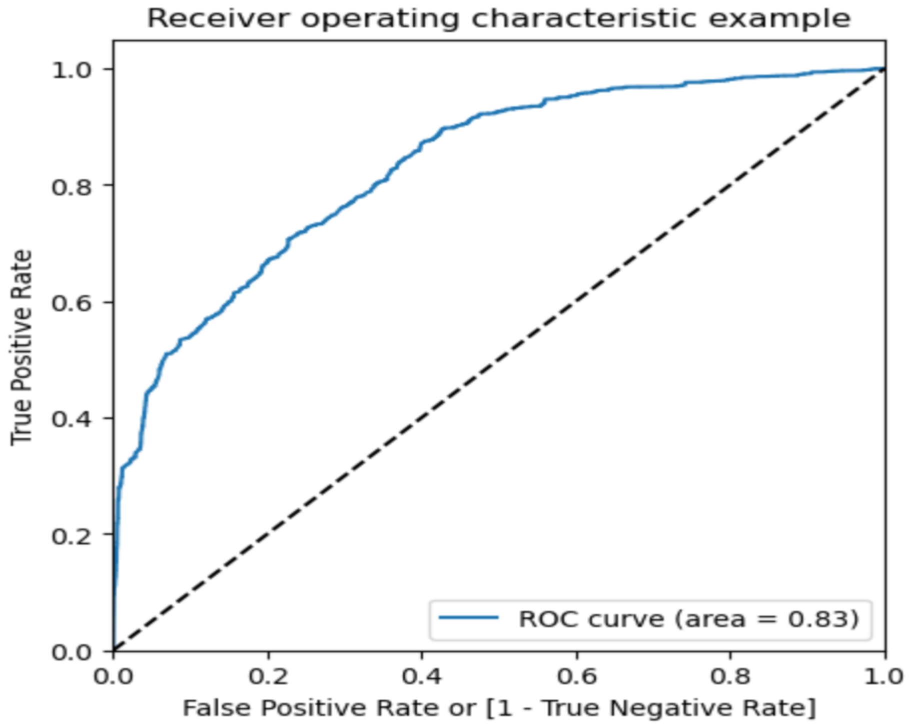
HEAT MAP OF TRAINING DATA



•The **Logistic Regression Model** was developed by eliminating multicollinearity and unnecessary variables, resulting in significant features with a **good ROC curve** (0.83).

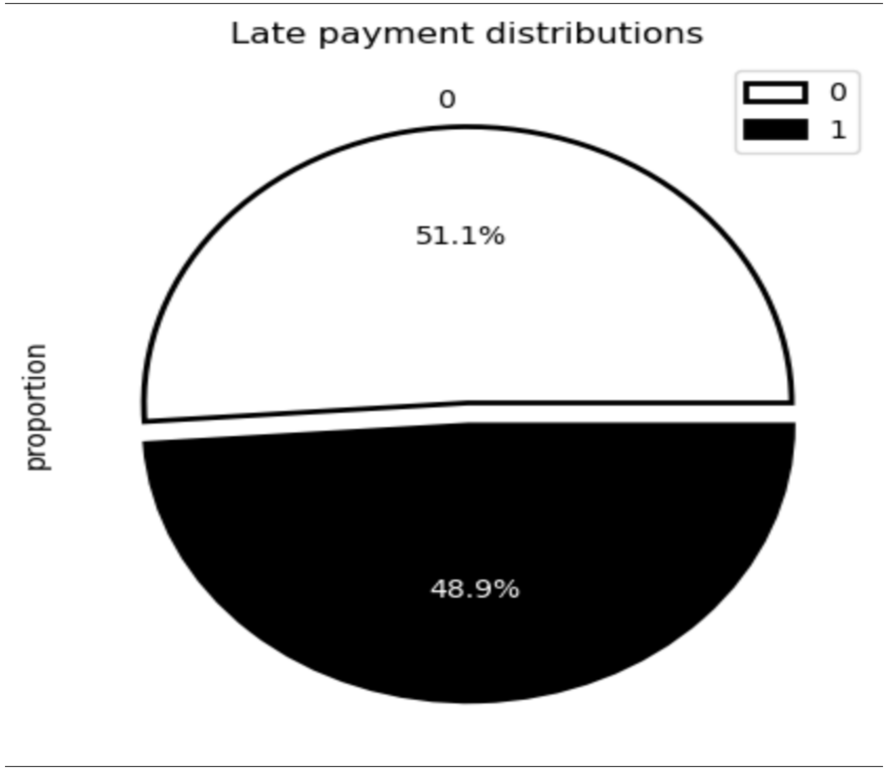
•The **optimal probability cutoff of ~0.6** was identified from the trade-off analysis between accuracy, sensitivity, and specificity, used to predict delayed payment transactions.

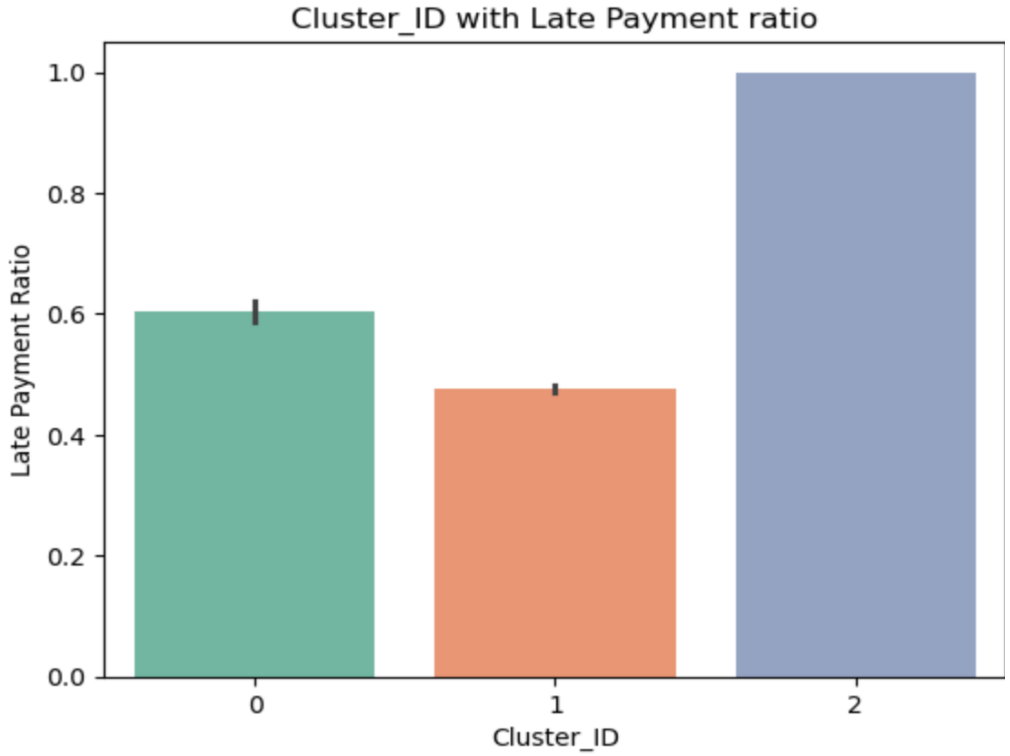




•The final model predicts that **51.1% of transactions** are likely to experience payment delays, which could significantly disrupt business operations.

•Customers with a history of **prolonged payment days** are expected to have a **near 100% delay rate**, compared to those with historically early or medium payment days, aligning with previous historical trends.





- Predictions indicate that **customers with the highest delay probabilities** are those with the most frequent delayed payments and total payments.
- The companies listed in the table on the left show the **maximum probability of default**, indicating the highest risk for delayed payments.

Customer_Name	Delayed_Payment	Total_Payments	Delay%
IL G Corp	13	13	100.0
RNA Corp	9	9	100.0
SHIS Corp	8	8	100.0
ALSU Corp	7	7	100.0
LVMH Corp	4	4	100.0
FINA Corp	4	4	100.0
V PE Corp	4	4	100.0
TRAF Corp	3	3	100.0
MAYC Corp	3	3	100.0
VIRT Corp	3	3	100.0

RECOMMENDATIONS

1.Tighten Payment Policies for Credit Note Payments:

- Credit Note payments experience the greatest delay rates compared to Debit Note or Invoice types.
- Enforce stricter payment collection policies for Credit Note invoices to reduce delays.

2.Stricter Policies for Goods-Type Invoices:

- Goods-type invoices have significantly higher payment delay rates.
- Implement stricter payment policies for goods-type invoices to address higher delay tendencies.

3.Focus on Lower-Value Payments:

- Lower-value payments make up most transactions and are associated with higher delay rates.
- Prioritize smaller payments, and consider applying penalties for late payments, especially for lower-value invoices.

4.Special Attention to Cluster 1 Customers (Prolonged Payment Duration):

- Cluster 1 customers, with prolonged payment delays, show much higher delay rates than early or medium-payers.
- Give special attention to Cluster 1 customers to reduce payment delays.

5.Prioritize Companies with High Delayed Payments and Probability of Future Delays:

- Companies with the highest total and delayed payment counts should be prioritized.
- Closely monitor and intervene early with companies that show high delay probabilities.


thank you