

E-commerce and Retail Case Study

Submission completed by :
Smriti Pradhan

Business Problem Statement

Schuster, a dominant global retailer in sports goods and accessories, is facing vendor payment delays, hampering operational efficiency and financial stability. To overcome this hurdle, we're categorizing customers by their payment history and forecasting potential late payments on outstanding invoices. This approach allows our collection teams to strategize and prioritize effectively.

Goals

- **Understand Customer Payment Behavior:** Analyze transaction data to identify diverse payment patterns among customers.
- **Segment Customers by Payment Patterns:** Segregate customers based on their distinct previous payment behaviors.
- **Predict Likelihood of Delayed Payments:** Utilize historical data to forecast the probability of late payments for open invoices.
- **Prioritize Collector Work:** Enable collectors to prioritize their efforts by preemptively following up with customers to ensure timely payments.

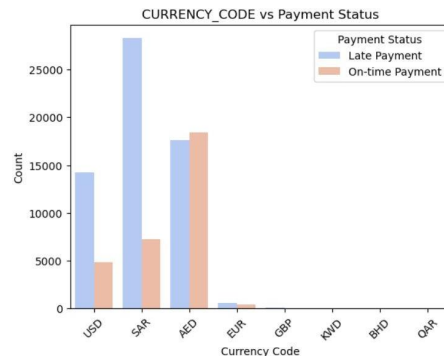
Answers Needed

- **Customer Transaction Analysis:** How can we effectively analyze transaction data to identify various payment behaviors among customers?
- **Customer Segmentation Method:** What approach can be used to categorize customers based on their past payment patterns and behaviors?
- **Prediction of Delayed Payments:** Can historical data be used to accurately predict the chances of delayed payments against open invoices from customers?
- **Business Insights from the Model:** What valuable business insights can be drawn from the developed model to optimize collection.

Exploratory Data Analysis

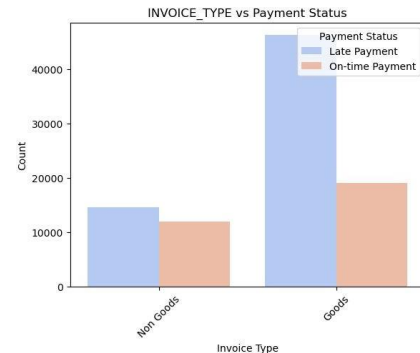
The currency denomination 'SAR' notably emerged as a major contributor to late payments, closely trailed by USA and AED currencies.

Recommendation: Prioritize attention and follow-up strategies on payments made in SAR, USA, and AED currencies to address and mitigate late payment issues effectively.

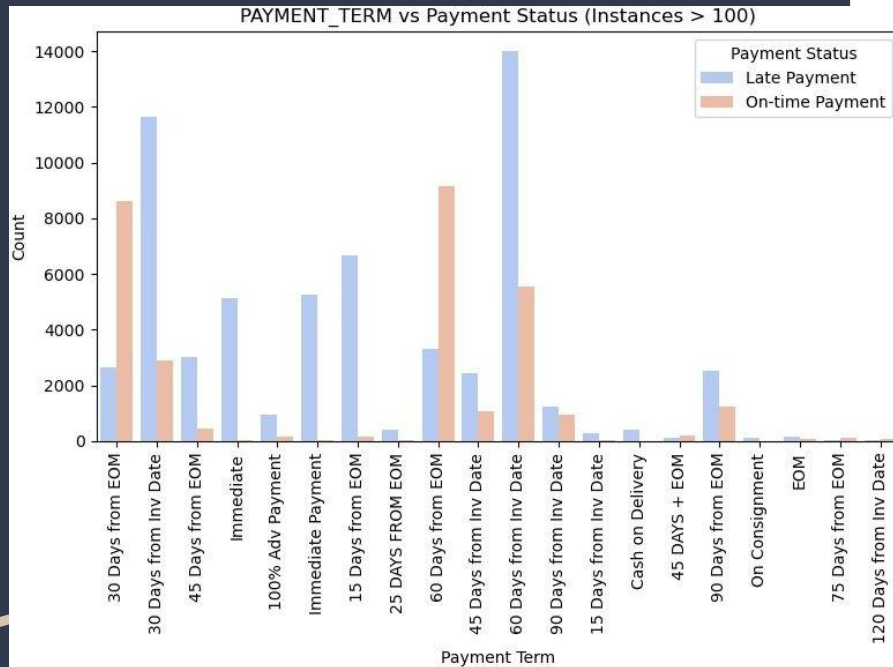


Primary Contributors to Late Payments: Goods

Concentrate collection strategies specifically on goods invoices.



Understanding Payment Terms & Late Payments

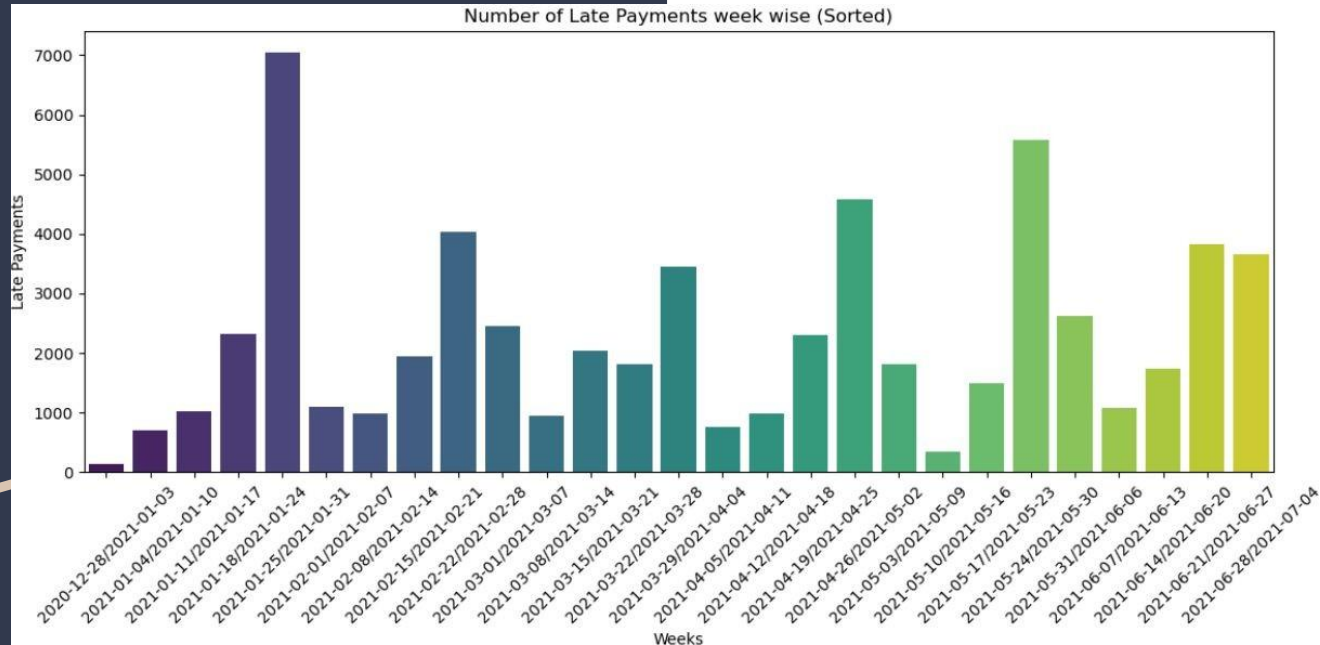


#1. Allowing a grace period for customers to make payments could be beneficial, as immediate payments frequently surpass the due dates, impacting the efficiency and performance of collection teams. This approach would not only provide customers with a payment window but also assist the invoicing team in avoiding last-minute hassles.

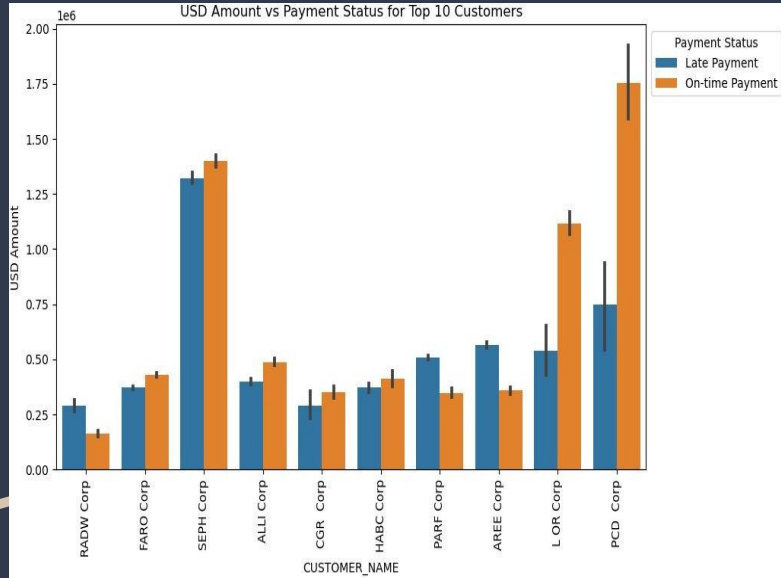
#2. Payment terms of 60 days and 30 days from the invoice creation date have led to inadequate payments, whereas terms of 60 days and 15 days from the end of the month (EOM) have ensured consistent on-time payments.

Are there tough week(s)?

Late payments within the organization exhibit weekly seasonality, marked by fluctuations in different weeks. By discerning these patterns, collection teams can proactively prepare and align their strategies for more effective collections.



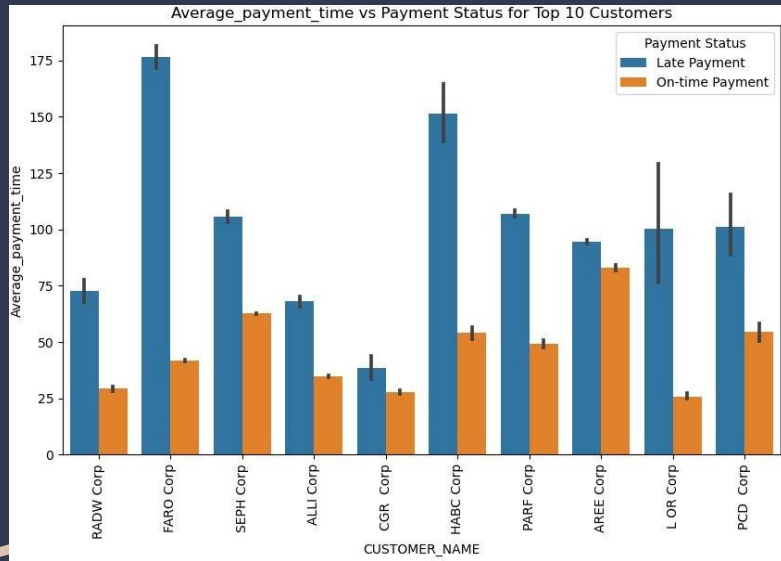
Top 10 customers hold 94% of total payment receivables, signifying their critical impact on cash flow.



Recommendation On Collection Strategy:

- 1.Focused Action:Direct specialized efforts toward these key customers.
- 2.Personalized Approach:Taylor strategies based on individual payment behaviors.
- 3.Proactive Engagement:Initiate proactive communication for timely payments.
- 4.Consistent Follow-ups:Implement a structured follow-up schedule.
- 5.Data-Driven Adaptation:Continuously analyze for strategy optimization.

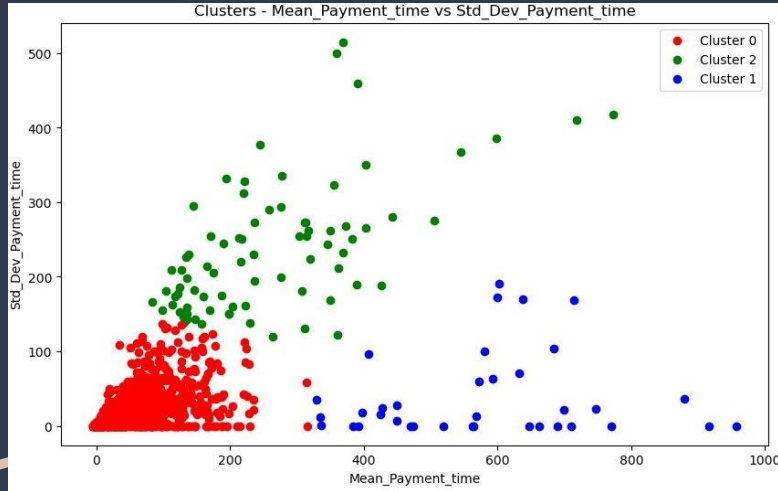
Top 10 customers: How Compliant are they with respect to the agreed payment terms?



Getting Customers on the Nice List:

1. **Early Payment Discounts:** Offer discounts for prompt payments before the due date.
2. **Reward Programs:** Implement loyalty rewards for consistent on-time payments.
3. **Referral Incentives:** Provide rewards for referring new clients with good payment practices.
4. **Exclusive Access:** Grant special access or benefits to consistent timely payers.
5. **Personalized Gifts/Perks:** Offer tailored gifts or additional services for meeting payment deadlines.
6. **Recognition:** Acknowledge and appreciate good payers with certificates or mentions.

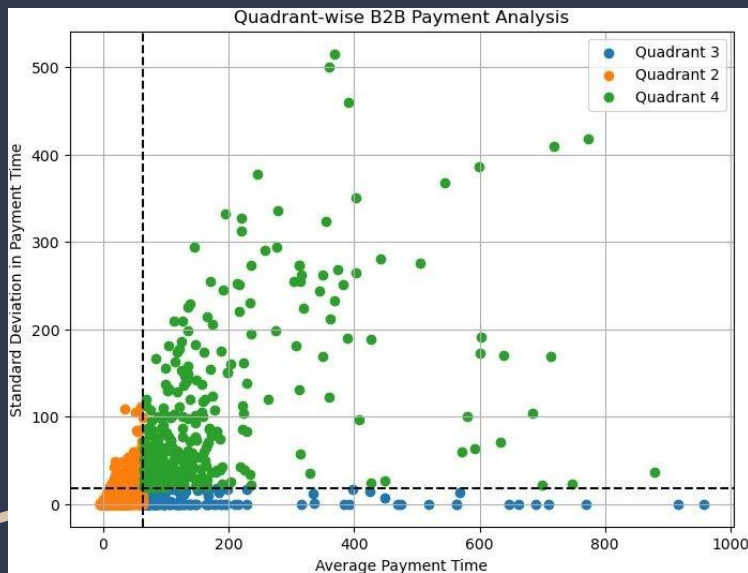
Model Building - Customer Segmentation



Payer Segments

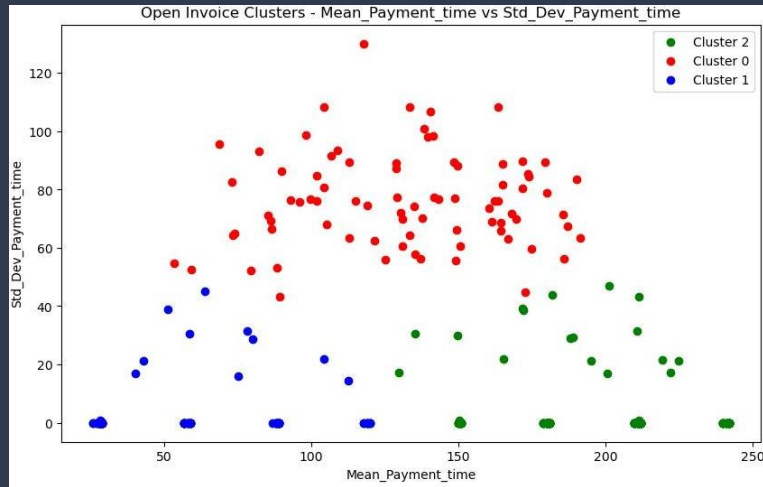
- 1. Cluster 0: Punctual Payers**
 - Low delay in payments
 - Low standard deviation
- 2. Cluster 1: Erratic Payers**
 - High payment time
 - Low standard deviation
- 3. Cluster2 : Variable Payers**
 - High deviation in payment time
 - High payment time

Impairment Strategies



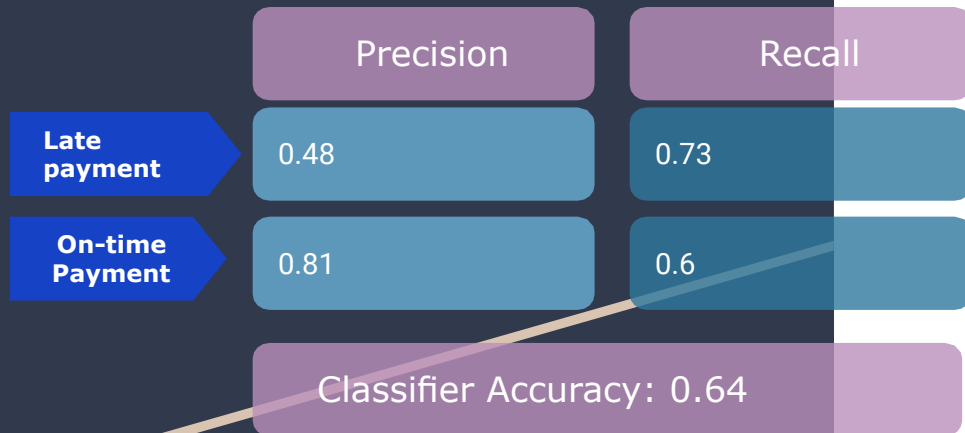
1. **Punctual Payers - "Reliable Champions"**
 - **Strategy:** Maintain good relations, offer loyalty perks for continued prompt payments, seek feedback for improvement.
2. **Erratic Payers - "Steady Improvement Focus"**
 - **Strategy:** Establish clear payment terms, provide incentives for consistent improvement, offer support for better adherence to timelines.
3. **Variable Payers - "Adaptive Engagement"**
 - **Strategy:** Implement flexible payment options, personalized follow-ups to understand payment challenges, and tailor solutions accordingly.

Strategies for Open Invoices



1. **Punctual Payers - "Reliable Champions"**
 - **Strategy:** Maintain good relations, offer loyalty perks for continued prompt payments, seek feedback for improvement.
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 - **Strategy:** Establish clear payment terms, provide incentives for consistent improvement, offer support for better adherence to timelines.
3. **Variable Payers - "Adaptive Engagement"**
 - **Strategy:** Implement flexible payment options, personalized follow-ups to understand payment challenges, and tailor solutions accordingly.

Using Random Forest to Build a 'Late Payment' Prediction Model



Precision:

- Class 0: 48%
- Class 1: 81%

Recall:

- Class 0: 73%
- Class 1: 60%

F1-score:

- Class 0: 58%
- Class 1: 69%

Accuracy:** Approximately 64%

This report indicates that while the model performs better in predicting class 1, it needs improvement in correctly identifying instances of class 0, as seen in the lower precision, recall, and F1-score for class 0 compared to class 1.

Model has the accuracy of 81% while predicting Late Payment Instance

Thank you

