# Upflow Case Study | Data Analysis Reporting

## Key Insights Derived:

1. **Total Amount of Unpaid Invoices in the Last Quarter**:

The total amount of unpaid invoices in the last quarter is $304,366. This highlights a significant amount of cash tied up in receivables, which can affect cash flow and operational efficiency.

2. **Top 10 Customers with the Highest Outstanding Balances**:

Key customers with large outstanding balances are crucial to target for collection efforts. This helps in prioritizing the most significant debtors for follow-up.

Example from the data: Customer 1161 having the highest outstanding amount to be paid 13651

3. **Average Payment Duration**:

The average payment duration for paid invoices is 45 days. This suggests that customers generally take longer than the standard 30-day payment terms, impacting cash flow.

4. **Monthly Invoice Issuance**:

The number of invoices issued each month has been consistent over the past year, indicating stable business activity. However, the collection of these invoices needs improvement to ensure timely cash flow.

5. **Customer with the Highest Total Payment Amount**:

The customer with the highest total payment amount is identified, showcasing their importance in revenue generation.

   - Example from the data: Customer 1293

6. **Percentage of Invoices Paid on Time**:

32% of invoices are paid on time, showing an improvable rate. Only 1% of invoices represent payments paid on the same day.

7. **Top 5 Products/Services by Sales**:

   Identified top-selling products/services help focus on maximizing revenue.

   - Example from the data: Service A has the highest amount of total sales.

8. **Seasonal Trends in Payment Delays**:

The average payment delay by quarter reveals that the highest average delay occurs in Q3 with 33 days. The delays in other quarters are relatively consistent, with Q1 at 28 days, Q2 at 30 days, and Q4 at 29 days, indicating potential end-of-year financial challenges for customers or seasonal business cycles affecting payment behavior.

Within BigQuery, a **payment delay prediction model** was developed utilizing its robust SQL-based machine learning capabilities. The process began with data preparation, where relevant data from invoices, payments, and customer segments was extracted, cleaned, and integrated. Key features such as DaysUntilDue and a binary label PaymentDelay were engineered. A logistic regression model was then trained using **BigQuery ML,** specifying input features and training the model with historical invoice data to predict payment delays. Once the model was trained, it was applied to new invoice data using ML.PREDICT, generating predictions on which invoices were likely to be paid late. This approach allowed for proactive management of collections, revision of payment terms, and enhanced monitoring, thereby improving cash flow management. The entire process, from data preparation to prediction, was seamlessly handled within BigQuery, leveraging its scalability and efficiency for advanced predictive analytics.

10. **Revenue generated per quarter**:

This data indicates strong performance in Q4 of 2023, with a slight dip in Q3 of 2023. The first two quarters of 2024 show steady revenue, with Q1 performing slightly better than Q2.

11. **Average invoice amount by customer segment:**

This data indicates that the average invoice amount for SMB customers is slightly higher than for Enterprise customers. This insight can help tailor invoicing and collection strategies based on customer segment.

## Patterns or Trends Observed :

1. **Seasonal Increase in Payment Delays:**
    - There is a significant increase in payment delays during Q4, suggesting customers may be managing their cash flows more tightly towards the end of the year.
2. **High DSO in Q4:**
    - Days Sales Outstanding (DSO) tends to be higher in Q4, reflecting delayed payments and necessitating improved collection efforts during this period.
3. **Consistently Late-Paying Customers:**
    - Certain customers consistently delay their payments, contributing to a higher average payment duration and impacting overall cash flow.

4. **Customer Distribution by Segment and Country:**

    - Enterprise customers are fairly evenly distributed across USA, Germany, France, UK, and Canada with counts ranging from 170 to 208.
    - SMB (Small and Medium Businesses) customers are more numerous in all listed countries, especially in the USA (251 customers) and France (227 customers**).**

5. **Average Invoice Amount per Segment:**

    - Enterprise customers have an average invoice amount of approximately $2,730.
    - SMB customers have a slightly higher average invoice amount at about $2,804. This might be influenced by specific high-value transactions or product types catered to SMBs.

6. **Payment Behavior (Proportion of Paid vs. Unpaid Invoices):**

    - Both customer segments show similar patterns in payment behavior:
        - Enterprise: 49% of invoices are paid, and 51% remain unpaid.
        - SMB: 48% of invoices are paid, and approximately 52% are unpaid.
    - This suggests a need to possibly enhance collection efforts or review credit policies across both segments.

## Key Performance Metrics:

1. **Days Sales Outstanding (DSO):**
    - Days Sales Outstanding (DSO) tends to be higher in Q4, reflecting delayed payments and necessitating improved collection efforts during this period.
    - For the first six months of 2024, the DSO fluctuates slightly between 15.0 and 16.0 days, indicating relatively quick turnover from sales to cash collection.
    - The stable DSO values suggest efficient accounts receivable management and stable customer payment behaviors. Consistently low DSO is beneficial for the company's cash flow, allowing for quicker reinvestment and reduced reliance on external financing.
2. **Collection Effectiveness**:
    - Collection effectiveness varies over time, with noticeable dips in efficiency, particularly in the last quarter. This highlights the need for a more robust and consistent collection strategy.
3. **Average Days Delinquent:**
    - An ADD of 30 days indicates a substantial delay in payment from customers, reflecting potential issues in cash flow management or customer payment compliance.
    - This metric suggests a need for reviewing credit policies and improving collections strategies to enhance liquidity and operational funding. Strategies might include adjusting payment terms, enhancing customer follow-ups, or offering early payment incentives to reduce payment delays.

**4. Aging Report:**

- The receivables aging analysis reveals that both Enterprise and SMB segments generally pay most invoices within 30 days, with noticeable increases in outstanding balances as invoices age beyond 60 days.

## Recommendations for Improving Cash Collection Processes:

1. Targeted Collections on Major Debtors

- **Insight**: Focus collection efforts on the top 10 customers with the highest outstanding balances.
- **Action**: Implement personalized follow-up strategies for these key accounts to expedite payment.

2. Revise and Tighten Payment Terms

- **Insight**: Re-evaluate and potentially tighten payment terms for customers who consistently delay payments.
- **Action**: Introduce stricter terms and penalties for late payments to encourage timely settlements.

3. Implement Automated Reminder Systems

- **Insight**: Utilize automated reminder systems to send timely payment reminders to customers.
- **Action**: Personalize these reminders to enhance their effectiveness and avoid impersonal communications that may be ignored.

4. Enhanced Monitoring and Predictive Analysis

- **Insight**: Use predictive modeling to proactively identify potential late payments.
- **Action**: Implement early intervention strategies for invoices predicted to be paid late, reducing the impact on cash flow.

5. Seasonal Preparedness

- **Insight**: Prepare for seasonal trends by enhancing collection efforts during Q4.
- **Action**: Introduce incentives for early payments and offer flexible payment plans to encourage timely settlements during this period.

6. **Systematic Receivables Processes**

- **Insight**: Implementing systematic and automated receivables processes can significantly improve collections.
- **Action**: Personalized reminders and follow-ups are more effective than generic automated emails.

**7. Customer Segmentation**

- **Insight**: Segmenting customers based on payment behavior can help tailor collection efforts.
- **Action**: High-risk customers can be managed more aggressively, while reliable payers can be offered incentives for early payments.

**8. Cash Flow Monitoring**

- **Insight**: Regular monitoring of cash flow metrics such as DSO (Days Sales Outstanding), ADD (Average Days Delinquent), and CEI (Collection Effectiveness Index) helps in identifying trends and making data-driven decisions to improve cash collections.

**9. Utilizing Technology**

- **Insight**: Leveraging advanced tools and technology, such as Upflow's AR automation software, can streamline the collections process and provide real-time insights into receivables performance.

By integrating these best practices with our data-driven insights, we can develop a comprehensive strategy to enhance cash collection processes and improve overall financial health.