

blinkit

Operational and Customer Behavior Analysis for Blinkit

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Introduction

This project is aimed at providing a comprehensive analysis of Blinkit's operational efficiency and customer behavior, with a focus on actionable insights to improve key business outcomes. Blinkit, a rapidly expanding online grocery delivery platform, operates in a highly competitive market where both **operational efficiency** and **customer satisfaction** are critical to sustained growth. The objective of this analysis is to support Blinkit in enhancing its service delivery, optimizing logistics, and improving customer retention.

The scope of this project covers the following key areas:

1. Customer Ordering Patterns and Retention

Analyzing customer behavior is essential for identifying trends, such as single-order customers and their distribution across different cities. By identifying customers who have placed only one order within a given period, we can help Blinkit develop targeted retention strategies aimed at reducing customer churn. This includes creating tailored marketing campaigns for cities with a higher proportion of single-order customers.

2. Customer Churn Analysis

Customer churn is a key concern for any online platform. This project explores the factors driving churn by identifying customers who have not placed an order in the last 30 days. Understanding the reasons behind customer disengagement will enable Blinkit to proactively address pain points, such as delivery delays, product availability, or user experience issues, thereby enhancing overall customer loyalty.

3. Delivery Efficiency and Logistics Optimization

Efficient delivery is central to Blinkit's promise of timely grocery delivery. We analyze the relationship between **delivery distances** and **delivery times** to assess how logistical factors impact operational performance. By understanding this relationship, Blinkit can make data-driven decisions to optimize delivery routes, reduce delivery times, and improve resource allocation, which will ultimately contribute to improved service levels.

4. **Store Performance and Revenue Generation**

This analysis also includes a deep dive into the revenue generated by different stores, helping to identify high-performing and underperforming locations.

Understanding store-level performance, including the products and categories that drive revenue, will allow Blinkit to optimize inventory management, align marketing efforts, and make informed decisions about resource allocation.

By leveraging SQL queries and advanced data analysis techniques, this project aims to provide Blinkit's leadership with critical insights that can drive strategic initiatives across operations, logistics, and customer management. The ultimate goal is to enable Blinkit to strengthen its market position, improve profitability, and deliver a superior customer experience in the highly competitive online grocery market.

A1. Calculate the average delivery time for all orders in each city.

```
SELECT
    AVG(ord.delivery_time), cu.city
FROM
    orders AS ord
    JOIN
    customers AS cu ON cu.customer_id = ord.customer_id
GROUP BY cu.city;
```

Output:

AVG(ord.delivery_time)	city
25.0000	Mumbai
45.0000	Bangalore
60.0000	Pune
35.0000	Delhi

Recommendation:

Improving operational efficiency in Pune and Bangalore by optimizing delivery routes, adding more delivery personnel, or expanding store locations closer to customer hubs could significantly enhance Blinkit's delivery performance and customer satisfaction.

A2. Find the top 3 customers based on the total order value they have placed.

```
SELECT
    c.customer_id,
    c.customer_name,
    SUM(o.total_amount * c.total_orders) AS total_order_value
FROM
    customers c
JOIN
    orders o ON c.customer_id = o.customer_id
GROUP BY
    c.customer_id, c.customer_name
ORDER BY
    total_order_value DESC
LIMIT 3;
```

Output:

customer_id	customer_name	total_order_value
1001	John Doe	2500.00
1003	Bob Smith	1000.00
1002	Alice Johnson	690.00

Insights:

These top three customers have placed higher-value orders, indicating strong engagement with the platform. Focusing on retaining these high-value customers through personalized offers, loyalty programs, and targeted marketing could further boost revenue. Additionally, identifying customers with similar characteristics for up-selling or cross-selling opportunities may help increase overall order values.

A3. Retrieve the top 3 most frequently ordered products in Mumbai.

```
SELECT
    p.product_id,
    p.product_name,
    SUM(od.quantity) AS total_quantity
FROM
    order_details od
JOIN
    orders o ON od.order_id = o.order_id
JOIN
    products p ON od.product_id = p.product_id
JOIN
    customers c ON o.customer_id = c.customer_id
WHERE
    c.city = 'Mumbai'
GROUP BY
    p.product_id, p.product_name
ORDER BY
    total_quantity DESC
LIMIT 3;
```

Output:

product_id	product_name	total_quantity
301	Milk	2
302	Bread	1
305	Rice	1

Insights and Recommendations:

- **Product Demand:** The data indicates that dairy products, particularly milk, hold significant appeal among Mumbai's consumers.
- **Inventory Management:** Maintaining adequate stock of these top-selling items can enhance customer satisfaction and minimize lost sales due to stockouts.
- **Targeted Marketing:** Consider targeted promotions or discounts on these frequently ordered products to encourage repeat purchases and increase overall sales.

A4. Identify the number of customers who have not placed an order in the last 30 days.

```
SELECT
    COUNT(*) AS inactive_customers_count
FROM
    customers
WHERE
    last_order_date < CURDATE() - INTERVAL 30 DAY;
```

Output:

	inactive_customers_count
▶	5

Insights:

- Inactive Customer Base:** The finding of 5 inactive customers suggests that there is a small segment of the customer base that has not engaged with Blinkit recently. This can indicate potential churn, where customers have stopped using the service for various reasons.
- Customer Retention Opportunities:** Since the count is relatively low, this presents an opportunity for Blinkit to implement targeted strategies to re-engage these customers. Understanding why these customers have not returned can help in crafting effective retention strategies.

A5. Calculate the total revenue generated by each store.

```
SELECT
    s.store_id,
    SUM(od.quantity * p.price) AS total_revenue
FROM
    stores s
JOIN
    orders o ON s.store_id = o.store_id
JOIN
    order_details od ON o.order_id = od.order_id
JOIN
    products p ON od.product_id = p.product_id
GROUP BY
    s.store_id
ORDER BY
    total_revenue DESC;
```

Output:

store_id	total_revenue
203	400.00
202	325.00
201	250.00

Recommendations:

1. **Boost Sales in Underperforming Stores:** Implement targeted marketing and promotions for Stores 201 and 202. Review and improve their product mix.
2. **Leverage Store 203's Success:** Replicate successful strategies from Store 203 across other stores.
3. **Optimize Operations:** Improve inventory management and analyze customer behavior to tailor offerings and boost sales across all stores.

B1. Write a SQL query to identify customers who placed only one order in the last 3 months.

```
SELECT
    o.customer_id,
    c.customer_name,
    COUNT(o.order_id) AS order_count
FROM
    orders o
JOIN
    customers c ON o.customer_id = c.customer_id
WHERE
    o.order_date <= CURDATE() - INTERVAL 3 MONTH
GROUP BY
    o.customer_id, c.customer_name
HAVING
    COUNT(o.order_id) = 1;
```

Output:

customer_id	customer_name	order_count
1002	Alice Johnson	1
1003	Bob Smith	1
1004	Charlie Brown	1

Insights:

1. **Single-Order Customers:** The SQL query identifies customers who placed only one order in the past three months. The output reveals that Alice Johnson, Bob Smith, and Charlie Brown are single-order customers.
2. **Potential Churn Risk:** Customers with only one recent order could be at risk of churn, as they may not be fully engaged or satisfied with the service.

B2. Create a list of cities with high percentages of single-order customers.

```
-- Step 1: Calculate total customers per city
WITH TotalCustomersPerCity AS (
    SELECT
        c.city,
        COUNT(c.customer_id) AS total_customers
    FROM
        customers c
    GROUP BY
        c.city
),

-- Step 2: Calculate customers with only one order in each city
SingleOrderCustomers AS (
    SELECT
        c.city,
        COUNT(c.customer_id) AS single_order_customers
    FROM
        customers c
    JOIN
        orders o ON c.customer_id = o.customer_id
    GROUP BY
        c.city, c.customer_id
    HAVING
        COUNT(o.order_id) = 1
),
```

```
-- Step 3: Combine both results and calculate percentage
> CitySingleOrderPercentage AS (
    SELECT
        t.city,
        t.total_customers,
        COALESCE(s.single_order_customers, 0) AS single_order_customers,
        (COALESCE(s.single_order_customers, 0) * 100.0 / t.total_customers) AS single_order_percentage
    FROM
        TotalCustomersPerCity t
    LEFT JOIN
        SingleOrderCustomers s ON t.city = s.city
)

-- Step 4: Final result sorted by percentage
SELECT
    city,
    total_customers,
    single_order_customers,
    single_order_percentage
FROM
    CitySingleOrderPercentage
ORDER BY
    single_order_percentage DESC;
```

Output:

city	total_customers	single_order_customers	single_order_percentage
Bangalore	1	1	100.00000
Pune	1	1	100.00000
Delhi	1	1	100.00000
Mumbai	2	0	0.00000

B3. Customer Churn Prediction Model: Feature Suggestions

To effectively predict customer churn, it is essential to identify and analyze key features that can influence customer's decision to continue using a service or product. Below are three critical features to consider when building a customer churn prediction model:

1. Customer Engagement Metrics

- **Description:** Measures the frequency and intensity of interactions between customers and the company. This can include data such as login frequency, time spent on the platform, and the number of transactions made over a specified period.
- **Rationale:** High engagement levels typically indicate customer satisfaction and loyalty. Conversely, a decline in engagement may signal potential churn, making this metric crucial for early detection.

2. Customer Demographics

- **Description:** Includes customer characteristics such as age, gender, location, and income level. This data can be collected through surveys or customer profiles.
- **Rationale:** Understanding the demographics of customers who are likely to churn can help tailor retention strategies. Different demographic segments may exhibit varying behaviors and preferences, providing insights into how to effectively engage them.

3. Customer Satisfaction and Feedback

- **Description:** Captures customer sentiment through surveys, ratings, and reviews, focusing on satisfaction with products, services, and overall experience. Metrics like Net Promoter Score (NPS) and Customer Satisfaction Score (CSAT) can be particularly useful.
- **Rationale:** Direct feedback from customers is invaluable in identifying pain points and areas of improvement. Lower satisfaction scores are often precursors to churn, making this feature vital for understanding customer retention dynamics.

B4. Strategies for Improving Customer Retention at Blinkit

To enhance customer retention, Blinkit can implement the following strategies, leveraging insights from the customer churn prediction model:

1. Customer Feedback Loop

- **Strategy:** Establish a robust feedback mechanism to continuously gather customer insights and improve services. This can involve regular satisfaction surveys, reviews, and direct customer interviews.
- **Implementation:**
 - Implement post-purchase surveys to assess customer satisfaction and gather suggestions for improvement.
 - Actively monitor customer reviews and feedback on social media and other platforms to identify common pain points.
 - Use this feedback to make informed changes to products, delivery services, and customer support processes, demonstrating to customers that their opinions are valued and acted upon.

2. Predictive Analytics for Proactive Retention

- **Strategy:** Utilize predictive analytics to identify customers at risk of churning and proactively engage them with targeted interventions.
- **Implementation:**
 - Analyze customer behavior patterns to identify indicators of churn (e.g., decreasing order frequency, negative feedback).
 - Implement automated campaigns to reach out to at-risk customers with incentives (discounts, personalized messages) to encourage them to return.
 - Monitor the effectiveness of these interventions and adjust strategies based on customer responses.

3. Enhanced Customer Support

- **Strategy:** Provide exceptional customer service by ensuring quick and effective resolution of customer issues, thereby enhancing overall satisfaction and loyalty.
- **Implementation:**
 - Implement a multi-channel customer support system (live chat, phone, email) that is easily accessible to customers.
 - Train customer support representatives to handle queries effectively and empower them to offer immediate solutions or compensations when necessary.
 - Use customer support interactions as opportunities to gather insights about common issues and areas for improvement.

C1. Analyze the relationship between the distance covered by delivery agents and the average delivery time. Use SQL to derive correlation metrics.

The analysis utilized the Pearson correlation coefficient to quantify the relationship between two key metrics: distance covered by delivery agents (in kilometers) and average delivery time (in minutes). From below SQL query:

```
WITH delivery_data AS (
  SELECT
    order_id,
    TIMESTAMPDIFF(MINUTE, deliverystartTime, deliveryendTime) AS delivery_time_minutes,
    distancecovered_km
  FROM
    delivery
),
correlation_components AS (
  SELECT
    COUNT(*) AS n,
    SUM(delivery_time_minutes) AS sum_x,
    SUM(distancecovered_km) AS sum_y,
    SUM(delivery_time_minutes * distancecovered_km) AS sum_xy,
    SUM(delivery_time_minutes * delivery_time_minutes) AS sum_xx,
    SUM(distancecovered_km * distancecovered_km) AS sum_yy
  FROM
    delivery_data
)

SELECT
  round((n * sum_xy - sum_x * sum_y) /
  SQRT((n * sum_xx - sum_x * sum_x) * (n * sum_yy - sum_y * sum_y)),4) AS correlation_coefficient
FROM
  correlation_components;
```

Output analysis:

The derived Pearson correlation coefficient of **0.975** suggests a very strong positive correlation between the distance covered by delivery agents and the average delivery time. This means that as the distance increases, the delivery time tends to increase correspondingly.

C2. Strategies to Optimize Store-Level Operations and Improve Delivery Efficiency.

1. Implement Advanced Route Optimization Algorithms

Utilizing advanced algorithms for route optimization can significantly enhance delivery efficiency. By leveraging technology that accounts for real-time traffic conditions, weather patterns, and delivery time windows, stores can create the most efficient routes for delivery agents. This not only reduces travel time and fuel costs but also ensures timely deliveries, thereby improving customer satisfaction. Additionally, periodic analysis of delivery data can help identify peak times and adjust routing strategies accordingly.

2. Enhance Inventory Management Systems

An effective inventory management system is crucial for reducing delays and improving delivery times. Implementing real-time inventory tracking can help stores maintain optimal stock levels and minimize stockouts. By utilizing demand forecasting tools, stores can anticipate customer needs and adjust inventory accordingly. This ensures that popular items are always available, reducing the time taken to fulfill orders and enhancing the overall efficiency of store operations.

3. Foster Collaboration Between Stores and Delivery Teams

Establishing strong communication channels between store personnel and delivery teams can lead to significant improvements in operational efficiency. Regular briefings and feedback sessions can help identify challenges faced during the delivery process and facilitate the sharing of best practices. By fostering a collaborative culture, stores can adapt quickly to any changes in demand or operational hurdles, leading to more effective problem-solving and enhanced service delivery.

C3. Revenue Maximization Formula for Blinkit.

To maximize revenue for Blinkit, we can develop a formula that incorporates key factors that influence sales. The formula can be expressed as follows:

$$\text{Revenue}=(P\times Q)-C+D)$$

Where:

- P = Average Price Per Product
- Q = Quantity Sold
- C = Total Costs (fixed and variable)
- D = Discounts and Promotions Offered

Explanation of Factors:

1. Average Price Per Product (P)

- This is the average selling price of products offered by Blinkit. Setting competitive prices can directly influence customer buying behavior. Regularly reviewing and adjusting prices based on market trends can help optimize revenue.

2. Quantity Sold (Q)

- This represents the total number of products sold within a specific period. To maximize revenue, it's essential to focus on strategies that increase sales volume, such as targeted marketing campaigns, loyalty programs, and partnerships with popular brands to attract more customers.

3. Total Costs (C)

- Total costs include both fixed costs (e.g., rent, salaries) and variable costs (e.g., cost of goods sold, delivery expenses). By reducing costs through efficient supply chain management, negotiating better rates with suppliers, and minimizing waste, Blinkit can improve its profit margins.

4. Discounts and Promotions (D)

- While discounts can reduce the immediate revenue from sales, strategically implemented promotions can drive higher sales volume. It is crucial to analyze the impact of discounts on overall revenue and ensure that they are designed to attract customers without severely impacting profitability.

By optimizing these key factors within the Revenue Maximization Formula, Blinkit can strategically enhance its revenue generation capabilities. Continuous monitoring and analysis of these variables will allow the company to make informed decisions that contribute to sustained financial growth.

C4. Per Order Profit Maximization Formula of Blinkit.

Creating a Per Order Profit Maximization Formula for a quick commerce business Blinkit involves considering various factors that influence profit on a per-order basis. Quick commerce typically involves rapid delivery of groceries and essentials, which adds unique dynamics to pricing and costs.

Here's a simplified formula and explanation of its components:

Per Order Profit Maximization Formula:

$$\text{Profit per order} = \text{Revenue per order} - \text{Cost per order}$$

Components Explained:

1. Revenue per order:
 - This is the total income generated from a single order.

Formula:

$$\text{Revenue per order} = P \times Q$$

Where:

- P = Selling price of the product.
- Q = Quantity of products ordered.

2. Cost per order: This encompasses all costs associated with fulfilling an order, which can include:
 - Product Costs: The cost to acquire the goods being sold.
 - Operational Costs: This includes warehousing, packaging, and logistics.
 - Delivery Costs: Costs associated with delivering the order to the customer.
 - Marketing Costs: Costs incurred in promoting the products or services.
 - Customer Acquisition Cost (CAC): The cost associated with acquiring a new customer.

Formula:

$$\text{Cost per order} = \text{Product Cost} + \text{Operation Cost} + \text{Delivery Cost} + \text{Marketing Cost} + \text{CAC}$$

3. Maximization Factors: To maximize profits, the formula can incorporate variables that can be adjusted:
 - **Price Optimization:** Adjusting P based on demand elasticity and competition.
 - **Cost Reduction:** Finding ways to lower operational and delivery costs, possibly through route optimization, better supplier agreements, or economies of scale.
 - **Bundling:** Encouraging larger orders or product bundling to increase Q.
 - **Customer Retention Strategies:** Reducing CAC through loyalty programs or repeat customer incentives.

C5. Comparative Analysis of Quick Commerce Platforms: Blinkit, Zepto, Instamart, and BigBasket ([Rediff](#))([Outlook Business](#)).

Introduction:

The quick commerce market in India has witnessed exponential growth, with several key players competing for market share. This report provides a comprehensive comparison of four leading platforms in this space: Blinkit, Zepto, Instamart, and BigBasket. The analysis focuses on various critical factors, including market capitalization, business model, customer base, delivery efficiency, and financial performance.

1. Market Capitalization

- **Blinkit:** Approximately \$13 billion.
- **Zepto:** Estimated at \$5 billion.
- **Instamart:** Operates under Swiggy, which has a valuation of around \$12 billion.
- **BigBasket:** Valued at around \$2 billion.

2. Customer Base and Growth

- **Blinkit:** Reported a **58%** increase in daily active users (DAUs) over the past year
- **Zepto:** Achieved an **86%** growth in DAUs, indicating aggressive user acquisition strategies.
- **Instamart:** Benefits from Swiggy's existing user base, although specific metrics are less publicly available.
- **BigBasket:** Despite competition, it retains a solid customer base with a **6%** revenue increase recently.

3. Delivery Efficiency

- **Blinkit and Zepto:** Leaders in quick commerce, both emphasizing rapid delivery within **10-15 minutes**.
- **Instamart:** Provides competitive delivery times, although they are generally longer than Blinkit and Zepto.
- **BigBasket:** More focused on reliability, with delivery times from **30 minutes to over an hour**.

4. Financial Performance

- **Blinkit:** While it has experienced revenue growth, profitability remains a challenge.
- **Zepto:** Continues to invest heavily in user growth, affecting immediate profits but positioning for future gains.
- **Instamart:** Exact profits are unclear due to its operation under Swiggy, but it likely benefits from the overall brand
- **BigBasket:** Reported a net loss of approximately **₹1,267 crore** in the last fiscal year, highlighting ongoing financial challenges.

Conclusion:

The comparison highlights the competitive landscape of the Indian quick commerce sector, showcasing how Blinkit, Zepto, Instamart, and BigBasket are navigating their challenges while capitalizing on the growing demand for rapid grocery delivery services. As market dynamics evolve, each company must strategically adapt to maintain and enhance its market position.

