**Project Report**

On

**Freshco Hypermarket Analysis**

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Contents

[1. Order level analysis 2](#_Toc170422842)

[1.1 Identify order distribution at slot and delivery area levels. 2](#_Toc170422843)

[1.2 Identify the areas having highest increase in monthly orders (from Jan to Sep) in absolute orders. 3](#_Toc170422844)

[1.3 Calculate delivery charges as a percentage of product amount at slot and month level. 5](#_Toc170422868)

[1.4 Calculate discount as a percentage of product amount at slot and month level. 7](#_Toc170422869)

[1.5 Calculate discount as a percentage of product amount at drop area and slot level. 8](#_Toc170422870)

[2. Completion Rate Analysis 9](#_Toc170422871)

[2.1 Identify Completion rate at slot vs day of the week (Sunday to Saturday) level. Can you spot some pattern in the data? 9](#_Toc170422872)

[2.2 Calculate completion rate at drop area level. 10](#_Toc170422883)

[2.3 Completion rate at number of products ordered level. For this first you need to create a column having number of product against every order. 12](#_Toc170422884)

[2.4 Give you analysis on any pattern you observe in the completion rate. 13](#_Toc170422885)

[3. Customer Level Analysis 14](#_Toc170422886)

[3.1 Identify Completion rate at source level. 14](#_Toc170422887)

[3.2 Calculate LTV for every customer. 15](#_Toc170422888)

[3.3 Calculate aggregated LTV at customer acquisition source level. Refer to aggregated LTV example. 16](#_Toc170422889)

[3.4 Calculate aggregated  LTV at acquisition month level. Refer to aggregated LTV example. 17](#_Toc170422890)

[3.5 What is the average Revenue(Product amount after discount) per order at different customer acquisition source level? 18](#_Toc170422891)

[3.6 What is the average Revenue(Product amount after discount) per order at the acquisition month level? 20](#_Toc170422892)

[3.7 Is there any pattern in order rating across slots, number of items placed, delivery charges, discount? 22](#_Toc170422893)

[4. Delivery Analysis 25](#_Toc170422894)

[4.1 Calculate average overall delivery time at month and delivery area level. 25](#_Toc170422895)

[4.2 Calculate the average overall delivery time at month and weekday/weekend level. You might need to create a column that will tag every date as either weekday or weekend. 26](#_Toc170422896)

[4.3 Calculate average overall delivery time at slot level. Refer to the definition of slot. 28](#_Toc170422897)

[4.4 Do you see any pattern in delivery charges with slot or delivery area. 29](#_Toc170422898)

[4.5 Do you see any pattern in delivery time and delivery area. If yes then find out logical reason. 31](#_Toc170422899)

# **1. Order level analysis**

## 1.1 Identify order distribution at slot and delivery area levels.

1. When analyzing the order distribution at the slot and delivery area level we found that order distribution at the late-night slot is comparatively less and in the morning slot the orders were comparatively high.

**Morning Slot:** Most orders are placed in the morning. This could be attributed to customers planning their day ahead and wanting their deliveries to arrive early. It suggests that customers prefer to place orders in the morning so they can receive their products in the afternoon or evening.

**Evening Slot:** The second-highest number of orders is placed in the evening. This might be due to customers placing orders after returning from work or after their daily activities are completed. It also indicates a preference for receiving deliveries the next day or later in the evening.

**Late Night Slot:** The number of orders placed during late-night hours is significantly lower compared to other time slots. This could be due to several factors such as reduced customer activity during these hours, limited delivery options, or the nature of products not being urgently needed at night.

2. Order Distribution at Delivery Area Level

When identifying the order distribution across different delivery areas, we found that certain areas have a higher concentration of orders. These areas are:

* **HSR Layout:** This area has a high density of orders. HSR Layout is a well-developed residential and commercial locality, which might explain the high volume of orders. The presence of a young working population, numerous restaurants, and retail stores contribute to the high order frequency.
* **ITI Layout:** ITI Layout is another area with a significant number of orders. Similar to HSR Layout, it is a well-established residential area with a good mix of amenities, making it a popular choice for online deliveries.
* **Harlur:** This locality also sees a high number of orders. Harlur is known for its residential complexes and proximity to IT hubs, which likely leads to a high demand for various delivery services.
* **Bommanahalli – Mico Layout:** This area is a major residential and industrial zone, contributing to a high number of orders. The combination of residential apartments and commercial establishments results in a demand for deliveries.
* **Kudlu:** Kudlu, being close to Electronic City and other IT parks, sees a significant volume of orders. The area has a more working population, leading to a high demand for online services.

These patterns in order distribution provide valuable insights into customer preferences and can help in optimizing delivery operations, stocking inventory in nearby warehouses, and planning marketing strategies for different time slots and areas.

## Identify the areas having highest increase in monthly orders (from Jan to Sep) in absolute orders.

## **When analyzing the data from January to September, we identified the following areas as having the highest increase in absolute monthly orders:**

## HSR Layout

## ITI Layout

## Harlur

## Bommanahalli – Mico Layout

## Kudlu

## These areas have shown significant growth in the number of orders placed each month. Here's a closer look at each area:

## **1. HSR Layout**

## HSR Layout continues to be a top performer in terms of order volume. This area, known for its vibrant residential and commercial mix, has consistently seen an increase in orders. Factors contributing to this growth include the influx of young professionals, the presence of numerous eateries, and the availability of various services catering to the needs of its residents.

## **2. ITI Layout**

## ITI Layout has also experienced a notable rise in monthly orders. This area is well-known for its established residential neighborhoods and amenities, which attract a steady stream of online orders. The increase in orders can be attributed to the growing population and enhanced delivery services in the area.

## **3. Harlur**

## Harlur has shown significant growth in order volume, reflecting its popularity among residents. The proximity to IT hubs and residential complexes has led to a rise in demand for deliveries. The area's infrastructure development and increased occupancy in residential complexes have contributed to the higher order numbers.

## **4. Bommanahalli – Mico Layout**

## Bommanahalli – Mico Layout is another area that has seen a substantial increase in orders. This locality, which includes both residential and industrial zones, has a high demand for various goods and services. The continuous development in the area, along with the growing population, has led to a significant rise in monthly orders.

## **5. Kudlu**

## Kudlu, with its proximity to Electronic City and other IT parks, has experienced a considerable increase in monthly orders. The area's growing residential population and the influx of working professionals have driven the demand for online services and deliveries.

## **Trend from July to September**

## From the data analysis, we observed a noticeable increase in monthly orders from July to September in these areas. Several factors could explain this trend:

## **Seasonal Factors:** The period from July to September often sees a rise in consumer spending due to various festivals, back-to-school shopping, and end-of-season sales. This seasonal uptick in spending behavior contributes to higher order volumes.

## **Promotions and Discounts:** Many e-commerce platforms and service providers run promotional campaigns and offer discounts during this period, encouraging more customers to place orders.

## **Improved Delivery Infrastructure:** Enhancements in delivery logistics and infrastructure, such as the opening of new delivery hubs or the optimization of delivery routes, can lead to an increase in order handling capacity and customer satisfaction, thereby boosting order numbers.

## **Customer Habits:** As more people become accustomed to the convenience of online shopping and delivery services, the overall volume of orders tends to increase, particularly in areas with a high concentration of working professionals and tech-savvy residents.

## 1.3 Calculate delivery charges as a percentage of product amount at slot and month level.

When analyzing delivery charges as a percentage of the product amount across different time slots, we observe that the charges vary significantly based on the time of day.

**Late Night Slots**

* **Higher Delivery Charges:** Delivery charges during late-night slots are higher compared to other slots. Several factors contribute to this:
  1. **Operational Costs:** Deliveries made late at night often incur higher operational costs, including additional pay for delivery personnel working night shifts and increased transportation costs due to lower availability of resources.
  2. **Demand and Supply:** The demand for late-night deliveries might be lower, but the supply (availability of delivery personnel) is also limited. This imbalance can lead to higher delivery charges.
  3. **Convenience Premium:** Customers opting for late-night deliveries are often willing to pay a premium for the convenience of receiving their orders outside of regular hours.

**Delivery Charges at Month Level**

When examining the monthly variation in delivery charges as a percentage of the product amount, we find that January stands out:

**January**

* **Highest Delivery Charges:** In January, the delivery charges as a percentage of the product amount are the highest. This can be attributed to several factors:
  1. **Seasonal Impact:** January often follows the holiday season when there might be an increased volume of orders and deliveries. The surge in demand can lead to higher delivery costs.
  2. **Weather Conditions:** In many regions, January can bring challenging weather conditions, such as snow and ice, which increase the complexity and cost of deliveries.
  3. **Post-Holiday Adjustments:** After the peak holiday season, companies might adjust their delivery charges to account for the increased operational costs incurred during the holidays and the immediate aftermath.

**Detailed Analysis**

By analyzing delivery charges as a percentage of the product amount at both slot and month levels, we gain valuable insights into the cost dynamics of delivery services. Here's a more detailed breakdown:

**Slot Level Analysis**

1. **Morning Slot:** Typically has the lowest delivery charges as a percentage of the product amount. This could be due to higher volumes of orders allowing for optimized and efficient delivery routes.
2. **Afternoon Slot:** Moderate delivery charges. The volume of orders is balanced, and operational costs are steady.
3. **Evening Slot:** Slightly higher delivery charges than the morning slot due to increased demand as people return home from work.
4. **Late Night Slot:** Highest delivery charges. As mentioned, this is due to increased operational costs, limited availability of delivery personnel, and the premium customers are willing to pay for late-night convenience.

**Month Level Analysis**

1. **January:** Highest delivery charges. Increased demand post-holiday season, challenging weather conditions, and operational adjustments contribute to higher costs.
2. **February to June:** Steady delivery charges. With no significant seasonal impact, the charges are relatively stable.
3. **July to September:** Moderate increase in delivery charges. Possible factors include mid-year promotional activities and back-to-school shopping trends.

## 1.4 Calculate discount as a percentage of product amount at slot and month level.

When analyzing the discounts provided to customers, we consider both the time slots and the months to understand patterns and trends.

**August**

* **Highest Discounts:** In the month of August, customers received discounts that exceeded 20% of the product amount across all time slots. This substantial discounting can be attributed to several possible factors:
  1. **Promotional Campaigns:** August is often a month when companies run significant promotional campaigns, possibly linked to back-to-school sales, end-of-season clearances, or special events and holidays.
  2. **Marketing Strategies:** Businesses might offer higher discounts to boost sales and clear out inventory before the arrival of new stock for the upcoming seasons.
  3. **Competitive Positioning:** Increased competition during this period can lead to businesses offering higher discounts to attract and retain customers.

**Detailed Analysis**

By examining the discounts as a percentage of the product amount across different time slots and months, we gain insights into customer savings and business strategies. Here's a more detailed breakdown:

**Slot Level Analysis**

1. **Morning Slot:** In August, discounts were consistently high, exceeding 20%. Morning shoppers benefited from these substantial savings, possibly due to early-bird promotional strategies.
2. **Afternoon Slot:** Similar to the morning slot, the afternoon slot saw discounts exceeding 20%. This indicates a uniform discounting strategy throughout the day.
3. **Evening Slot:** Evening shoppers also received discounts exceeding 20%, suggesting that businesses aimed to attract customers during peak shopping hours with attractive offers.
4. **Late Night Slot:** Even in the late-night slot, discounts exceeded 20%. This could be an effort to encourage shopping during less busy hours by offering significant savings.

**Month Level Analysis**

1. **January to July:** Discounts varied but were generally lower than those observed in August. These months may have seen moderate discounting tied to specific events or slower periods.
2. **August:** The standout month for discounts, with customers receiving more than 20% off the product amount in every time slot.

## Calculate discount as a percentage of product amount at drop area and slot level.

* **Highest Discount in the Evening Slot:** Jayanagar stands out with the highest discount observed in the evening time slot, amounting to 35.61%. This significant discount percentage can be attributed to several factors:

1. **Promotional**
2. **FocusCustomer**
3. **Behavior** **Market Competition**

**General Nighttime Trends**

* **Higher Discounts at Night:** Across various drop areas, discounts tend to be higher during the night time slot compared to other time slots. Several reasons could explain this trend:
  1. **Encouraging Late-Night Shopping**
  2. **Operational Considerations**
  3. **Special Promotions**

**For Customers:** Knowing that Jayanagar offers the highest discounts in the evening and that nighttime slots generally have higher discounts can help customers plan their purchases to maximize savings. Shoppers in Jayanagar, in particular, can take advantage of evening deals for substantial savings.

**For Businesses:** Analyzing these discount trends can help businesses refine their promotional strategies, target specific customer behaviors, and optimize resource allocation. Offering higher discounts during nighttime slots can drive sales during off-peak hours, while targeted evening promotions in areas like Jayanagar can capture more market share.

# **Completion Rate Analysis**

## 2.1 Identify Completion rate at slot vs day of the week (Sunday to Saturday) level. Can you spot some pattern in the data?

**From the above chart, we can analyze the completion rate at slot vs day of the week level.**

**Late Night Deliveries**

1. **Poor Completion Rate:** The completion rate for late-night deliveries is notably poor across the days of the week. Several factors contribute to this trend:
2. **Customer Availability:** Customers might not be readily available to receive deliveries late at night, leading to a higher rate of missed or rescheduled deliveries.
3. **Operational Challenges:** Night-time deliveries can face logistical challenges such as restricted access to certain areas, reduced staff availability, and safety concerns, all contributing to lower completion rates.
4. **Order Cancellations:** Customers may place orders with the intention of late-night delivery but cancel or postpone them due to changing plans or preferences.

**Morning Time Slot**

* **High Completion Rate:** The completion rate for morning deliveries is quite high across all days of the week. This can be attributed to several factors:

## **Customer Preference**

## **Operational Efficiency**

## **Lower Traffic**

**Day of the Week Analysis**

* **Sunday to Saturday:** The patterns in completion rates are consistent across the days of the week, but some variations might exist due to specific customer behavior on weekends versus weekdays.
  1. **Weekdays (Monday to Friday):** Morning deliveries have high completion rates as people start their day and are available to receive packages. Late-night deliveries suffer due to the reasons mentioned above.
  2. **Weekends (Saturday and Sunday):** While morning completion rates remain high, there might be slight variations in late-night deliveries due to weekend activities and customers' availability.

## 2.2 Calculate completion rate at drop area level.

**Completion Rate at Drop Area Level**

The completion rate measures the percentage of successful deliveries out of the total deliveries attempted in a specific area. This metric is crucial for understanding operational efficiency and customer satisfaction in different regions.

**Key Observations**

**Cox Town and Whitefield**

* **Completion Rate of 0%:** The completion rate in Cox Town and Whitefield is notably 0%, indicating that no deliveries were successfully completed in these areas during the analyzed period. Several factors could contribute to this unusual trend:
  1. **Access Issues:** There might be logistical challenges such as restricted access to buildings or gated communities that prevent successful deliveries.
  2. **Customer Availability:** Customers in these areas might not be available at the expected times, leading to failed delivery attempts.
  3. **Address Issues:** Incorrect or incomplete addresses could result in delivery failures.

**Average Completion Rate**

* **Average Completion Rate of 93%:** Across all drop areas, the average completion rate is a high 93%. This indicates that the majority of deliveries are successfully completed, reflecting overall operational efficiency and effective delivery processes.

**Detailed Analysis**

**Areas with 0% Completion Rate**

* **Cox Town and Whitefield:**
  1. **Potential Access Issues:** Delivery personnel might face difficulties accessing certain buildings or areas, leading to unsuccessful attempts.
  2. **Customer Engagement:** Residents in these areas might not be responsive or available during delivery times, causing repeated failures.
  3. **Address Accuracy:** Issues with the accuracy and completeness of delivery addresses can significantly impact success rates.

**Areas with High Completion Rates**

* **General Trends:** The high average completion rate of 93% suggests that most areas have efficient delivery systems and responsive customers. Factors contributing to high completion rates include:
  1. **Effective Communication**
  2. **Accurate Address Information**
  3. **Customer Availability**

## 2.3 Completion rate at number of products ordered level. For this first you need to create a column having number of product against every order.

**Completion Rate at Number of Products Ordered Level**

The completion rate measures the percentage of successful deliveries out of the total deliveries attempted. Analyzing the completion rate concerning the number of products ordered provides insights into how order size affects delivery success.

**Key Observations**

**Higher Number of Products**

* **High Completion Rate:** The data shows that orders with a higher number of products have a significantly high completion rate, at 99.6%. This suggests that larger orders are more likely to be successfully delivered. Several factors contribute to this trend:
  1. **Customer Commitment:** Customers placing larger orders are likely more committed to receiving their deliveries, ensuring they are available at the time of delivery.
  2. **Value of Orders:** Higher-value orders often receive more attention from both the delivery personnel and the customer, leading to higher completion rates.
  3. **Efficient Planning:** Larger orders might be prioritized and planned more carefully to ensure successful delivery due to their higher value and importance.

**Detailed Analysis**

To understand the completion rate at the number of products ordered level, let's break down the factors and implications:

**Number of Products per Order**

1. **Single Product Orders:** These might have a slightly lower completion rate due to customers potentially being less committed or available for smaller, less significant deliveries.
2. **Multiple Product Orders:** Orders with more products show a higher completion rate, at 99.6%. This indicates a strong positive correlation between the number of products in an order and the likelihood of successful delivery.

**Factors Contributing to Higher Completion Rates**

1. **Customer Availability:** Customers who place larger orders are likely to ensure they are available to receive their delivery, understanding the importance and value of the items ordered.
2. **Delivery Priority:** Delivery services may prioritize larger orders due to their higher value, ensuring they reach the customer on time.
3. **Order Importance:** Larger orders often include a variety of products that the customer needs, making them more vigilant about receiving the delivery.

## 2.4 Give you analysis on any pattern you observe in the completion rate.

1. The pattern here we found in completion rate is completion rate is low at late night time slot and very high in the Morning.

2. the areas of Cox-town and Whitefield have a 0% completion rate.

3. the top 3 areas where the number of orders is high are (HSR layout, ITI layout & harlur) has a 100% completion rate

**Analysis of Completion Rate Patterns**

**1. Time Slot Pattern**

* **Low Completion Rate at Late Night:**
  1. **Customer Availability:** Late-night deliveries often coincide with times when customers are less likely to be available to receive packages, leading to more missed deliveries.
  2. **Operational Challenges:** There are logistical and safety challenges associated with late-night deliveries, such as restricted access to certain areas and limited availability of delivery personnel.
  3. **Rescheduling and Cancellations:** Customers might request rescheduling or even cancel orders that are set for late-night delivery due to convenience issues.
* **High Completion Rate in the Morning:**
  1. **Customer Preparedness:** Customers are more likely to be prepared and available for deliveries in the morning, especially if they are expecting packages to start their day.
  2. **Operational Efficiency:** Morning slots often benefit from fresh and well-planned delivery routes, leading to higher efficiency and successful completions.
  3. **Lower Traffic:** Morning deliveries can avoid peak traffic hours, resulting in fewer delays and more timely deliveries.

**2. Drop Area Pattern**

* **0% Completion Rate in Cox Town and Whitefield:**
  1. **Access Issues:** Specific logistical challenges such as restricted entry to certain buildings or gated communities might be prevalent in these areas.
  2. **Address Problems:** Incorrect or incomplete address information could be leading to failed deliveries.
  3. **Customer Behavior:** There might be a pattern of customer unavailability or a higher rate of cancellations and rescheduling in these areas.
* **100% Completion Rate in High Order Areas (HSR Layout, ITI Layout, Harlur):**
  1. **Effective Delivery Processes:** These areas likely have well-established delivery processes and routes, ensuring efficient and successful deliveries.
  2. **Customer Engagement:** High customer engagement and communication might contribute to the high completion rate, with customers ensuring they are available for delivery.
  3. **Address Accuracy:** Accurate and complete address information in these areas facilitates smoother delivery operations.

**3. Correlation with Order Volume**

* **High Completion Rate with More Products Ordered:**
  1. **Customer Commitment:** Customers placing larger orders are more committed to receiving them, ensuring they are available for delivery.
  2. **Value of Orders:** Larger orders are often of higher value, prompting both delivery services and customers to prioritize successful delivery.
  3. **Operational Focus:** Delivery services might prioritize larger orders due to their higher importance and value, ensuring more careful handling and planning.

# 3.Customer Level Analysis

## 3.1 Identify Completion rate at source level.

**Organic Source:**

**High Completion Rate:** The completion rate for orders sourced organically is very high at 99.63%.

**Possible Reasons:**

* + 1. **Customer Engagement:** Customers who find and place orders through organic sources (e.g., directly visiting the website, organic search, word-of-mouth) tend to be more engaged and motivated. They likely have a higher intent to purchase and are more committed to receiving their orders.
    2. **Trust and Loyalty:** Organic sources often attract repeat customers who have a higher level of trust and loyalty towards the brand, leading to fewer cancellations and rescheduled deliveries.

**Offline Campaign:**

* + **Lower Completion Rate:** The completion rate for orders sourced through offline campaigns is slightly lower at 99.44%.
  + **Possible Reasons:**
    1. **Impulse Purchases:** Offline campaigns (e.g., physical advertisements, flyers, events) may attract more impulse buyers who are less committed to their purchases, leading to higher cancellation or rescheduling rates.
    2. **Awareness and Expectation:** Customers sourced through offline campaigns may have less awareness of the brand or may have different expectations, potentially leading to issues that affect completion rates.

**Detailed Insights**

**Organic Source**

* **Engaged Customer Base:** Customers who discover the brand organically are likely to be more invested in their purchase journey, having actively sought out the brand. This results in higher engagement and a stronger commitment to completing the purchase.
* **Repeat Customers:** Organic sources often bring in repeat customers who have prior positive experiences with the brand, contributing to a higher completion rate.

**Offline Campaigns**

* **Marketing Impact:** While offline campaigns can effectively raise brand awareness and attract new customers, they may also bring in a higher proportion of casual or impulse buyers. These customers might be more prone to cancellations or changes in delivery plans.
* **Expectation Management:** Customers from offline campaigns may have different expectations based on the promotional context. Ensuring clear communication and setting accurate expectations can help improve the completion rate for this segment.

## Calculate LTV for every customer.

## 3.3 Calculate aggregated LTV at customer acquisition source level. Refer to aggregated LTV example.

**Analysis of Aggregated LTV at Customer Acquisition Source Level**

**Snapchat**

* **High Aggregated LTV:** Snapchat has an aggregated LTV of $370.
* **Reasons:**
  1. **Engagement:** Customers acquired through Snapchat might be more engaged with the brand, leading to higher spending and longer retention periods.
  2. **Target Demographics:** Snapchat’s user base, which tends to be younger and highly active on social media, may align well with the brand’s target audience, leading to higher LTV.

**Instagram**

* **Lower Aggregated LTV:** Instagram has a slightly lower aggregated LTV of 327, despite having more customers.
* **Reasons:**
  1. **Customer Behavior:** While Instagram attracts a large number of users, these customers might have lower average spending or shorter retention periods compared to Snapchat.
  2. **Competition:** The high level of competition and advertising on Instagram could lead to more casual or price-sensitive customers, impacting the overall LTV.

**Detailed Insights**

**Snapchat**

1. **High Customer Value:** The high LTV from Snapchat indicates that customers acquired through this platform are highly valuable. They likely exhibit strong engagement, high purchase frequency, and longer retention.
2. **Marketing Strategy:** Investing more in Snapchat marketing campaigns could yield high returns, given the significant aggregated LTV.

**Instagram**

1. **Large Customer Base:** Despite a lower average LTV, the sheer number of customers acquired through Instagram contributes to a substantial aggregated LTV.
2. **Opportunity for Growth:** Strategies to increase customer engagement and retention on Instagram could further enhance the LTV. Personalized marketing, loyalty programs, and targeted promotions might be effective.

## 3.4 Calculate aggregated  LTV at acquisition month level. Refer to aggregated LTV example.

**Analysis of Aggregated LTV at Acquisition Month Level**

1. **April and May:**
   * **High Aggregated LTV:** Both April and May show high aggregated LTV
   * **Possible Reasons:**
     1. **Seasonal Promotions:** April and May coincide with key promotional periods, leading to higher customer acquisition and retention rates.
     2. **Customer Behavior:** Customers acquired during these months might exhibit higher engagement and spending behavior due to seasonal needs or preferences.
2. **September:**
   * **Low Aggregated LTV:** September has a significantly lower aggregated LTV.
   * **Possible Reasons:**
     1. **Post-Peak Period:** September might follow peak purchasing periods (such as back-to-school in August), leading to a lower average LTV as customers are less likely to make significant purchases.
     2. **Lower Engagement:** Customers acquired in September might show lower engagement or retention rates compared to those acquired during peak promotional periods.

## 3.5 What is the average Revenue(Product amount after discount) per order at different customer acquisition source level?

**Average Revenue per Order by Customer Acquisition Source**

1. **Snapchat:**
   * **Highest Average Revenue:** $363.5
   * **Possible Reasons:**
     1. **Engaged Audience:** Snapchat’s user base may consist of highly engaged users who are likely to make larger purchases.
     2. **Target Demographics:** The demographics targeted through Snapchat might align well with higher-value products or services offered by the brand.
2. **Google:**
   * **High Average Revenue:** $363.1
   * **Possible Reasons:**
     1. **Intent-Driven Traffic:** Customers acquired through Google, especially via search ads, often have a high purchase intent, leading to higher average order values.
     2. **Effective Targeting:** Google's targeting algorithms help reach customers who are ready to make a purchase, increasing the average revenue per order.
3. **Facebook:**
   * **Moderately High Average Revenue:** $349
   * **Possible Reasons:**
     1. **Wide Reach:** Facebook’s extensive user base allows for targeting a broad audience, including high-value customers.
     2. **Engagement and Ads:** Effective engagement strategies and personalized ads on Facebook contribute to higher order values.
4. **Offline Campaign:**
   * **Average Revenue:** $346
   * **Possible Reasons:**
     1. **Local Impact:** Offline campaigns, such as events or local advertisements, can effectively attract customers willing to spend more.
     2. **Promotional Efforts:** Discounts and promotions during offline campaigns might attract high-value orders.
5. **Organic:**
   * **Average Revenue:** $343
   * **Possible Reasons:**
     1. **Loyal Customers:** Customers who find the brand organically tend to be more loyal and may spend more per order.
     2. **Brand Trust:** Organic traffic often includes repeat customers who trust the brand, leading to higher average order values.
6. **Instagram:**
   * **Lowest Average Revenue:** $322
   * **Possible Reasons:**
     1. **Casual Browsing:** Instagram users might engage in more casual browsing, leading to lower average order values.
     2. **High Competition:** The competitive advertising environment on Instagram might lead to attracting more price-sensitive customers.

**Detailed Insights**

**High-Value Sources (Snapchat and Google)**

* **Snapchat:** With the highest average revenue per order, Snapchat proves to be a valuable acquisition source. The platform’s younger, engaged demographic likely contributes to this high value. Leveraging Snapchat’s features like stories and ads can enhance customer acquisition strategies.
* **Google:** The high average revenue per order indicates that customers acquired through Google have strong purchase intent. Investing in Google Ads and optimizing for high-intent keywords can drive more high-value orders.

**Moderate-Value Sources (Facebook and Offline Campaign)**

* **Facebook:** The average revenue per order on Facebook is substantial, indicating effective targeting and engagement. Enhancing ad campaigns and utilizing Facebook’s analytics for better audience insights can further boost revenue.
* **Offline Campaigns:** Offline campaigns yield significant revenue per order. Combining online and offline strategies, such as QR codes and exclusive in-store promotions, can optimize customer acquisition.

**Lower-Value Sources (Organic and Instagram)**

* **Organic:** While the average revenue per order is slightly lower than other sources, it remains a vital channel due to the loyalty and trust associated with organic traffic. Improving SEO, content marketing, and customer loyalty programs can enhance organic revenue.
* **Instagram:** Despite having the lowest average revenue per order, Instagram remains a valuable channel for brand visibility. Utilizing Instagram Shopping features and targeted ads can help increase the average order value.

## 3.6 What is the average Revenue(Product amount after discount) per order at the acquisition month level?

**Average Revenue per Order by Acquisition Month**

1. **May:**
   * **Highest Average Revenue:** $401
   * **Possible Reasons:**
     1. **Seasonal Promotions:** May might coincide with significant promotional periods, such as spring sales or pre-summer promotions, driving higher purchase values.
     2. **Customer Behavior:** Customers might be preparing for summer, leading to larger purchases.
2. **April:**
   * **High Average Revenue:** $376
   * **Possible Reasons:**
     1. **Pre-Summer Sales:** Similar to May, April might benefit from spring promotions, encouraging higher spending.
     2. **Easter Holidays:** Easter and related holidays can drive sales of gifts and seasonal items, increasing average order values.
3. **June:**
   * **High Average Revenue:** $364
   * **Possible Reasons**
     1. **Summer Preparations:** Customers might be making significant purchases in preparation for summer activities and vacations.
     2. **Mid-Year Sales:** Some brands might run mid-year sales or promotions in June, boosting average revenue.
4. **July:**
   * **Moderately High Average Revenue:** $360
   * **Possible Reasons:**
     1. **Continued Summer Shopping:** The trend of higher spending may continue as summer progresses, with people buying for vacations, back-to-school, or seasonal items.
5. **February:**
   * **Average Revenue:** $367.2
   * **Possible Reasons:**
     1. **Valentine’s Day:** February sales might be driven by Valentine's Day purchases, including gifts, leading to higher average order values.
     2. **Post-Holiday Shopping:** Customers might still be shopping for deals after the holiday season.
6. **January:**
   * **Average Revenue:** $367.1
   * **Possible Reasons:**
     1. **New Year Sales:** Post-holiday sales and New Year promotions can drive significant purchases.
     2. **Gift Card Redemption:** Customers redeeming holiday gift cards can lead to higher order values.
7. **March:**
   * **Lower Average Revenue:** $353
   * **Possible Reasons:**
     1. **Post-Holiday Slowdown:** March might see a slowdown in spending after the peak holiday and New Year periods.
     2. **Seasonal Transition:** Fewer major holidays or events in March can result in lower spending.
8. **August:**
   * **Lower Average Revenue:** $327
   * **Possible Reasons:**
     1. **End of Summer:** Spending may taper off as the summer season ends and customers prepare for back-to-school.
     2. **Vacation Period:** Many people might be on vacation, leading to reduced shopping activity.
9. **September:**
   * **Lowest Average Revenue:** $286
   * **Possible Reasons:**
     1. **Post-Summer Slowdown:** After the summer season, there is often a reduction in discretionary spending as people return to regular routines.
     2. **Back-to-School:** While back-to-school shopping can drive sales, the average order values might be lower due to the nature of purchases (e.g., school supplies rather than high-value items).

**Detailed Insights**

**High-Value Months (April, May, June, and July)**

* **April and May:**
  1. **Promotional Periods:** Spring and pre-summer promotions significantly drive higher average order values.
  2. **Marketing Strategy:** Focusing on aggressive promotions and marketing campaigns during these months can maximize revenue.
* **June and July:**
  1. **Seasonal Spending:** Continued summer preparations and mid-year sales contribute to high average order values.
  2. **Customer Engagement:** Engaging customers with targeted summer-related promotions can enhance sales.

**Moderate-Value Months (January, February, and March)**

* **January and February:**
  1. **Post-Holiday Sales:** Leveraging post-holiday and New Year promotions can maintain high order values.
  2. **Special Occasions:** Capitalizing on Valentine's Day and other events can boost February sales.
* **March:**
  1. **Transition Period:** March may require strategic promotions to combat the post-holiday spending slowdown.
  2. **Marketing Initiatives:** Introducing new products or exclusive offers can help maintain customer interest and spending.

**Low-Value Months (August and September)**

* **August:**
  1. **End of Season:** Implementing end-of-summer clearance sales and back-to-school promotions can help boost average order values.
  2. **Customer Retention:** Engaging customers returning from vacations with targeted offers can enhance spending.
* **September:**
  1. **Post-Summer Strategies:** Introducing early fall promotions and preparing for upcoming holiday sales can help counteract the post-summer slowdown.
  2. **Market Analysis:** Understanding customer needs during this transition period can inform better-targeted marketing campaigns.

## 3.7 Is there any pattern in order rating across slots, number of items placed, delivery charges, discount?

**Analysis of Order Rating Patterns**

**1. Order Rating by Time Slot**

**Pattern Observed:**

1. Morning Slot: High order ratings
2. Late Night Slot: Low order ratings

**Possible Reasons:**

* **Morning Slot:**
  1. Timeliness: Morning deliveries are likely to be on time, contributing to higher satisfaction.
  2. Customer Expectation: Customers may have higher expectations for promptness and accuracy in the morning.
* **Late Night Slot:**
  1. Delays: Late-night deliveries might face delays due to fewer delivery personnel or logistical challenges.
  2. Customer Patience: Customers may be less patient or more critical of late-night deliveries, leading to lower ratings.

**Implications:**

1. Operational Improvements: Focus on improving the efficiency and timeliness of late-night deliveries to boost customer satisfaction.
2. Resource Allocation: Ensure adequate staffing and resources for late-night slots to handle deliveries better.

2**. Order Rating by Month**

**Pattern Observed:**

1. March: High order ratings
2. May and September: Low order ratings

**Possible Reasons:**

* **March:**
  1. Post-Holiday Calm: After the holiday rush, operations may run more smoothly, leading to higher satisfaction.
  2. Customer Experience: Customers might experience less stress and have higher satisfaction levels in March.
* **May and September:**
  1. High Volume: May and September might have high order volumes (e.g., pre-summer and back-to-school periods), leading to operational challenges and lower ratings.
  2. Promotions and Discounts: High promotional activities can sometimes overwhelm the delivery system, causing delays and errors.

**Implications:**

1. Capacity Planning: Enhance capacity and streamline operations during high-volume months to maintain high order ratings.
2. Customer Communication: Improve communication and manage customer expectations during peak periods.

**3. Order Rating by Number of Products**

**Pattern Observed:**

* More than 21 Products: High order ratings

**Possible Reasons:**

* Bulk Orders:
  1. Customer Investment: Customers placing larger orders may have higher expectations and satisfaction when their needs are met.
  2. Perceived Value: Larger orders might come with better discounts or promotions, enhancing perceived value and satisfaction.

**Implications:**

1. Incentivize Bulk Orders: Encourage bulk orders with attractive discounts and promotions, ensuring high service levels to maintain high ratings.
2. Customer Loyalty Programs: Develop loyalty programs targeting bulk purchasers to further enhance satisfaction and retention.

**4. Order Rating by Delivery Charges**

**Pattern Observed:**

* Delivery Charges between $100 and $200: Low order ratings

**Possible Reasons:**

* High Delivery Charges:
  1. Customer Expectations: Higher delivery charges may lead to higher expectations for service quality.
  2. Value Perception: Customers might feel they are not getting value for money, leading to dissatisfaction.

**Implications:**

1. Review Delivery Charges: Evaluate and optimize delivery charges to ensure they are perceived as fair and reasonable by customers.
2. Improve Service Quality: Enhance service quality for orders with higher delivery charges to meet customer expectations and improve ratings.

# Delivery Analysis

## 4.1 Calculate average overall delivery time at month and delivery area level.

**Average Overall Delivery Time Analysis**

**Month-Level Analysis**

1. **February:**
   * **Low Delivery Time:** February shows a low delivery time compared to other months. This could be due to several factors:
     1. **Post-Holiday Period:** After the busy holiday season, logistics and delivery services may experience lower demand and smoother operations, leading to quicker delivery times.
     2. **Weather Conditions:** Depending on the region, February may experience milder weather conditions that facilitate easier transportation and logistics.
2. **May and August:**
   * **High Delivery Time:** May and August exhibit higher delivery times compared to other months. Possible reasons include:
     1. **Peak Season:** May and August often coincide with peak shopping periods or seasonal events (such as back-to-school or summer vacations), increasing demand for deliveries and potentially leading to longer delivery times.
     2. **Logistical Challenges:** Increased demand can strain logistics networks, resulting in delays in processing and delivering orders.

**Delivery Area (HSR Layout) Analysis**

* **Consistently Low Delivery Time:** HSR Layout consistently shows low delivery times across all months. This could be attributed to:
  1. **Efficient Logistics:** Effective logistics and delivery routes in the HSR Layout area contribute to quicker delivery times.
  2. **High Service Standards:** Delivery services may prioritize and allocate resources effectively in areas with high demand and customer volume, such as HSR Layout.
  3. **Customer Density:** Higher customer density in HSR Layout might lead to shorter travel distances and faster delivery completions.

**Detailed Insights**

**Month-Level Insights**

1. **Operational Efficiency in February:** Utilize insights from February's low delivery times to identify operational efficiencies that can be replicated during other periods of the year.
2. **Addressing Peaks in May and August:** Develop strategies to manage higher delivery times in May and August, such as optimizing routes, increasing temporary staff during peak periods, and enhancing communication with customers.

**Delivery Area Insights (HSR Layout)**

1. **Benchmark for Efficiency:** Use HSR Layout as a benchmark for efficient delivery operations, identifying best practices that can be applied to other areas with varying delivery times.
2. **Customer Satisfaction:** Continuously monitor and maintain high service standards in areas like HSR Layout to ensure consistent, timely deliveries and enhance customer satisfaction.

## Calculate the average overall delivery time at month and weekday/weekend level. You might need to create a column that will tag every date as either weekday or weekend.

**Average Overall Delivery Time Analysis**

**Month-Level Analysis**

1. **February:**
   * **Low Delivery Time:** February shows a low delivery time compared to other months. This could be due to factors such as:
     1. **Post-Holiday Period:** After the busy holiday season, logistics and delivery services may experience lower demand and smoother operations, leading to quicker delivery times.
     2. **Weather Conditions:** Depending on the region, February may experience milder weather conditions that facilitate easier transportation and logistics.
2. **May and August:**
   * **High Delivery Time:** May and August exhibit higher delivery times compared to other months. Possible reasons include:
     1. **Peak Season:** May and August often coincide with peak shopping periods or seasonal events (such as back-to-school or summer vacations), increasing demand for deliveries and potentially leading to longer delivery times.
     2. **Logistical Challenges:** Increased demand can strain logistics networks, resulting in delays in processing and delivering orders.

**Weekday vs. Weekend Analysis**

* **More Orders on Weekdays:** Typically, weekdays see a higher volume of orders compared to weekends. This can be attributed to regular work and school schedules where people are more likely to shop and order goods online during weekdays.
* **Longer Delivery Times on Weekends:** Despite fewer orders, weekends often experience longer delivery times across most areas. Several factors may contribute to this phenomenon:
  1. **Staffing and Resource Allocation:** Delivery services may have reduced staffing or resources allocated for weekends, leading to slower order processing and delivery.
  2. **Customer Availability:** Customers may be more available to receive deliveries on weekdays, facilitating quicker completion of deliveries compared to weekends when they might be engaged in other activities or outings.
  3. **Traffic and Logistics:** Increased weekend traffic or logistical challenges, such as limited operating hours for businesses or delivery services, can contribute to longer delivery times.

## 4.3 Calculate average overall delivery time at slot level. Refer to the definition of slot.

**Analysis of Delivery Time by Slot**

1. **Morning, Afternoon, and Evening Slots:**
   * **High and Similar Delivery Times:** The analysis shows that delivery times in the morning, afternoon, and evening slots are high and similar in duration. Possible reasons include:
     1. **Peak Demand:** These slots often experience peak order volumes, leading to higher delivery times as delivery services manage larger volumes.
     2. **Traffic and Logistics:** Higher traffic during these times can lead to delays in deliveries, impacting overall delivery times.
     3. **Customer Availability:** Customers are typically more available during these times, which might increase order volumes but also potentially complicate delivery logistics.
2. **Late Night Slot:**
   * **Low Average Delivery Time:** The late-night time slot shows a lower average delivery time compared to morning, afternoon, and evening slots. Reasons for this might include:
     1. **Lower Order Volume:** Fewer orders are typically placed during late-night hours, allowing delivery services to process and fulfill orders more quickly.
     2. **Less Traffic:** Reduced traffic and logistical challenges during late-night hours contribute to quicker delivery times.
     3. **Efficient Operations:** Delivery services may prioritize late-night deliveries for efficiency, given the lower volume and fewer logistical obstacles.

## **4.4 Do you see any pattern in delivery charges with slot or delivery area.**

**Brookfield and Frazer Town:**

* **High Delivery Charges:** Both Brookfield and Frazer Town have significantly higher delivery charges during the late-night slot.

**Detailed Insights**

**High Delivery Charges in Brookfield and Frazer Town**

**Pattern Observed:**

* **Late-Night Slot:** The delivery charges are notably high in the late-night slot for both Brookfield and Frazer Town.

**Possible Reasons:**

1. **Increased Operational Costs:**
   * **Late-Night Premium:** Deliveries during late-night hours often incur additional costs due to the need for extra staffing, security measures, and higher wages for late-night shifts.
   * **Safety and Security:** Ensuring the safety of delivery personnel during late-night hours can require additional resources, contributing to higher operational costs.
2. **Limited Availability:**
   * **Reduced Workforce:** There may be fewer delivery personnel available during late-night hours, leading to increased costs for those willing to work these shifts.
   * **Operational Constraints:** Limited availability of delivery vehicles and other logistical constraints during late-night hours can drive up costs.
3. **Customer Willingness to Pay:**
   * **Convenience Factor:** Customers may be willing to pay a premium for the convenience of late-night deliveries, encouraging businesses to set higher delivery charges.
   * **Urgency:** The perceived urgency of late-night orders can justify higher delivery fees, as customers might need items immediately.

**Implications and Strategies**

**Brookfield and Frazer Town:**

* **Optimizing Late-Night Deliveries:**
  + **Resource Allocation:** Allocate more resources and personnel to handle late-night deliveries efficiently, potentially reducing the need for high delivery charges.
  + **Improved Planning:** Use data analytics to predict demand and optimize delivery routes, minimizing operational costs.
* **Customer Communication:**
  + **Transparency:** Clearly communicate the reasons for higher delivery charges during late-night slots to customers, emphasizing the added convenience and safety measures.
  + **Incentives:** Offer incentives for customers to choose non-peak delivery times, such as discounts for morning or afternoon slots.

## 4.5 Do you see any pattern in delivery time and delivery area. If yes then find out logical reason.

**Analysis of Delivery Time Patterns by Delivery Area**

**1. High Delivery Time in Mahadevapura**

* **High Delivery Time:** The delivery time in Mahadevapura is significantly higher, with an average delay of 1 hour and 49 minutes after the order is placed, resulting in a total delivery time of up to 2 hours.

**Possible Reasons:**

1. **Traffic Congestion:** Mahadevapura may experience heavy traffic congestion, particularly during peak hours, causing delays in delivery times.
2. **Geographical Factors:** The layout or geographical spread of Mahadevapura might present logistical challenges, making it difficult for delivery personnel to navigate efficiently.
3. **Operational Delays:** There could be delays in dispatching the delivery personnel or inefficiencies in the local delivery process specific to this area.

**Implications:**

1. **Traffic Management:** Implement strategies to avoid peak traffic hours and optimize delivery routes.
2. **Operational Efficiency:** Enhance dispatch processes and improve logistical planning to minimize delays.
3. **Local Staffing:** Consider increasing the number of delivery personnel in Mahadevapura to handle high order volumes and reduce delivery times.

**2. High Delivery Time in Brookfield**

**Pattern Observed:**

* **High Delivery Time:** In Brookfield, delivery times are notably longer, particularly for orders placed in the late-night slot.

**Possible Reasons:**

1. **Late-Night Deliveries:** Orders placed late at night often take longer to deliver due to reduced staffing, fewer delivery vehicles, and potential safety concerns.
2. **Logistical Constraints:** During late-night hours, logistical constraints such as limited access to certain areas and restricted operating hours of local businesses might contribute to delays.
3. **Operational Challenges:** There might be fewer delivery personnel available during late-night shifts, leading to increased delivery times.

**Implications:**

1. **Improve Late-Night Operations:** Enhance staffing and resources for late-night deliveries to ensure timely service.
2. **Safety Measures:** Implement safety protocols to ensure the security of delivery personnel and optimize delivery routes for late-night operations.
3. **Customer Communication:** Communicate expected delivery times more effectively to manage customer expectations for late-night orders.

**Detailed Insights**

**Traffic and Geographical Challenges**

* **Mahadevapura:**
  1. **Traffic Patterns:** Understanding local traffic patterns can help in planning better delivery routes and avoiding peak congestion times.
  2. **Infrastructure:** Assessing the local infrastructure and making necessary adjustments in delivery strategies can improve efficiency.

**Late-Night Delivery Constraints**

* **Brookfield:**
  1. **Staffing Solutions:** Increasing the number of delivery personnel or extending delivery shifts during late-night hours can reduce delivery times.
  2. **Logistical Adjustments:** Making logistical adjustments such as optimizing delivery routes and using technology for real-time tracking can enhance efficiency.