

# SALES OPTIMIZATION & CUSTOMER BEHAVIOR ANALYSIS FOR MAVEN ROASTERS

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## Business Problem

The client recently became a franchise owner at Maven Roasters, a coffee shop chain with three locations in New York City.

To gain deeper insight into customer purchase behavior and improve operational efficiency, transactional data from January to June 2023 has been collected.

The objective is to analyze this data to uncover sales trends, identify top-performing products and time periods, and develop a dynamic dashboard that supports informed decision-making in sales, inventory, and marketing strategies.

## Key Business Questions

1. What are the sales trends by location and time period (daily, weekly, monthly)?
2. Which product categories and types generate the most revenue and volume?
3. Are there peak transaction times and days that can inform staffing and inventory decisions?
4. Which location performs best overall and why?
5. What are the most and least popular products in each location?

## Dataset Overview

The dataset includes the following variables:

- Transaction ID
- Transaction Date
- Transaction Time
- Transaction Quantity
- Store ID
- Store Location
- Product ID
- Unit Price
- Product Category
- Product Type
- Product Detail

## Deliverables

A data-driven report and a dynamic dashboard that franchise owners can use to identify patterns, trends and opportunities for the business.

## ANALYSIS AND FINDINGS

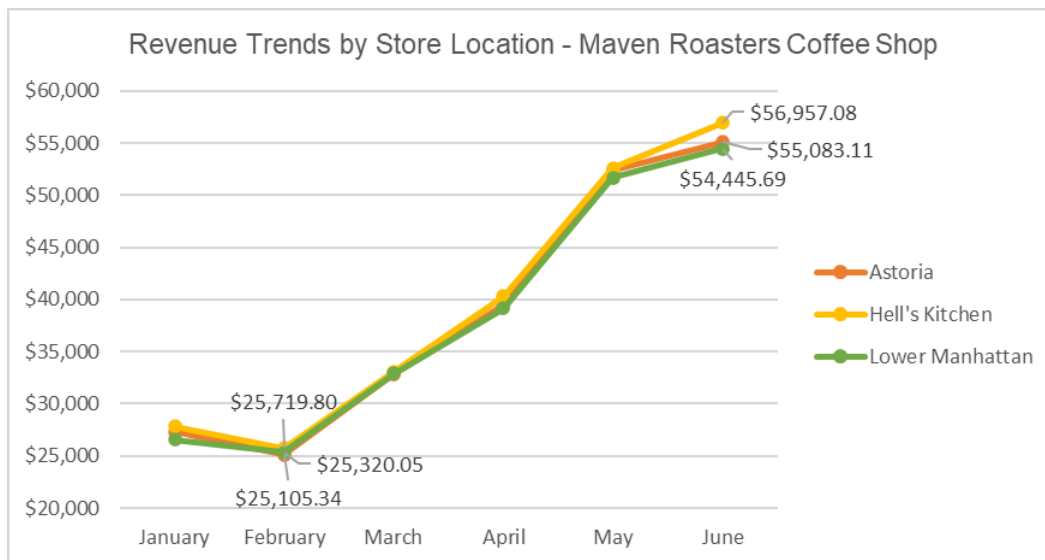
While this dataset provides valuable insights into sales patterns, product performance, and pricing consistency across locations, it has notable limitations that restrict the scope of analysis. Specifically, it lacks staff and labor data, inventory or stock information, customer feedback, equipment and supply chain details, advertising performance, and comprehensive operational efficiency metrics. Consequently, although sales trends and product performance can be closely monitored, a thorough diagnosis of operational issues requires additional data sources beyond what this dataset offers.

### Sales and Revenue Trends

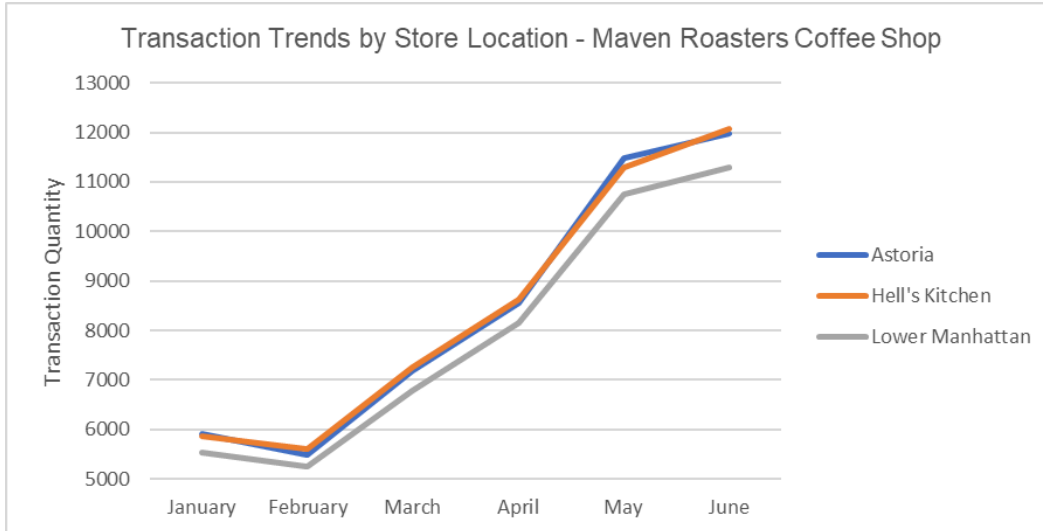
Sales performance is consistent across the three locations: Astoria, Hell's Kitchen, and Lower Manhattan. While there are slight variations in absolute revenue, most notably with Hell's Kitchen performing marginally better, the overall trend is remarkably aligned. All locations exhibit a similar trajectory, with parallel increases particularly evident from March onward.

Sales tend to rise in the months leading up to summer, peaking in June, which marks the highest revenue period across all three locations. Although the available data does not span a full year, preventing confirmation of long-term seasonal trends, the current pattern indicates that the brand and/or its products are most popular during the summer and surrounding months.

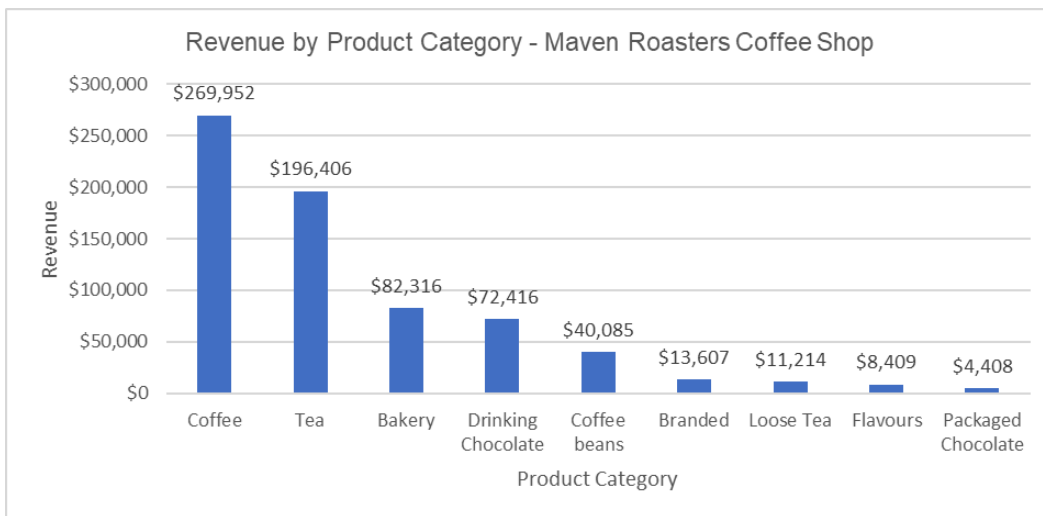
Conversely, February records the lowest revenue, making it the weakest sales month. Further analysis could help identify the factors contributing to this drop in performance and explore strategies to boost customer interest and purchasing activity during this period.



When comparing revenue and transaction volume, it is evident that the Lower Manhattan location consistently sees the fewest monthly customers and generates the lowest monthly revenue, positioning it as the least performing location. In contrast, Astoria and Hell's Kitchen demonstrate similar and stronger performance levels.



The following chart shows the revenue generated over the six-month period by the three locations under analysis, broken down by product category. This ranking reflects the monthly product category rankings for each location, with only minor variations that do not provide significant insights.



The top performing product categories are:

- Coffee: 40% of total revenue
- Tea: 30% of total revenue

The mid-level performing product categories are:

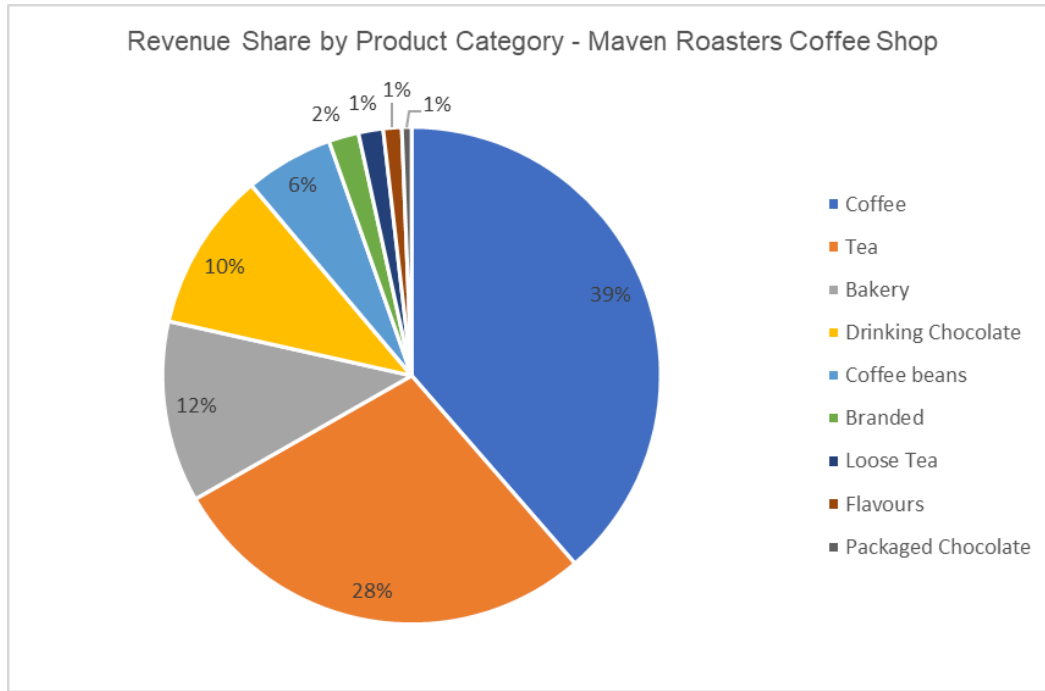
- Bakery: 12% of total revenue
- Drinking Chocolate: 10% of total revenue

The lowest performing category is:

- Packaged Chocolate.

These insights identify which product categories are the primary drivers of revenue.

The next chart visualizes the revenue distribution by product category across the three locations and period under analysis.

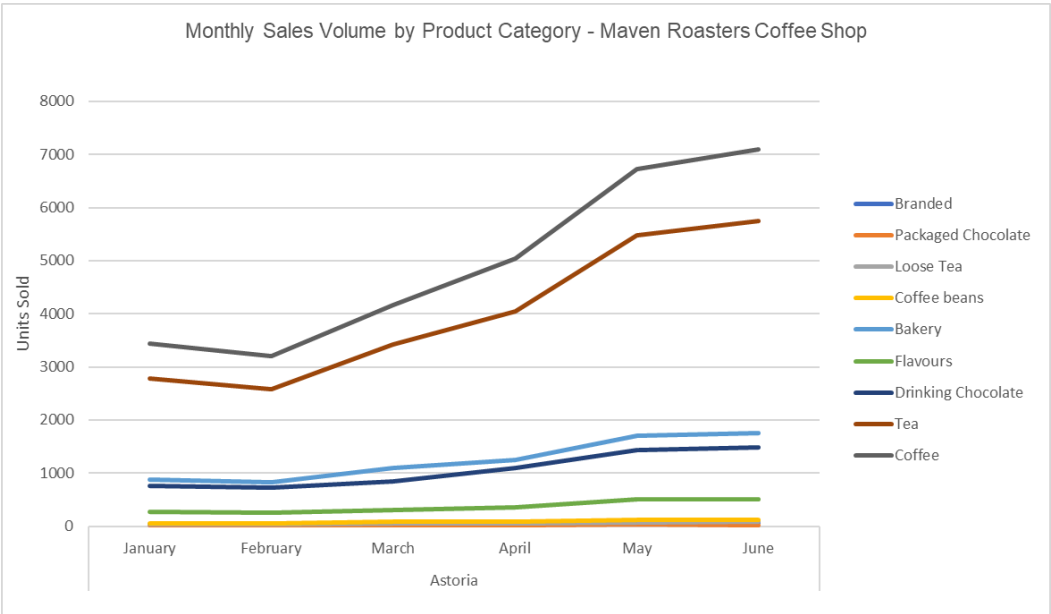
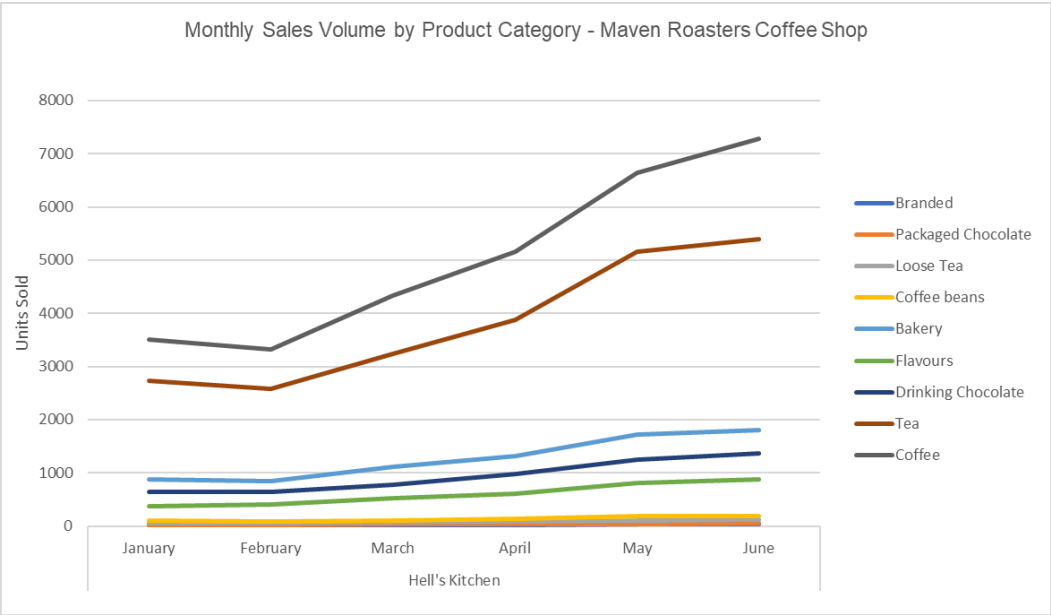


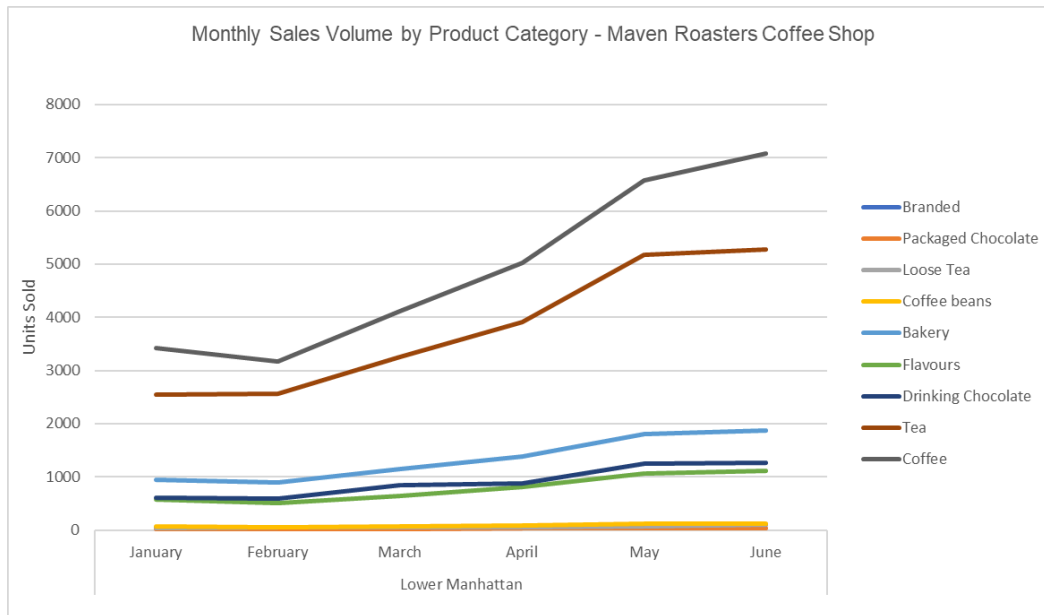
Sales trends by category over the analyzed period for each location illustrate how the sales volume of each category evolved, revealing which products gained or maintained popularity during the same timeframe and which categories were primarily responsible for fluctuations in overall sales and, consequently, revenue.

It is not news that the least purchased categories (Coffee Beans, Loose Tea, Packaged Chocolate, and Branded merchandise) are not significant contributors to sales, but also, the next three graphs of each location's monthly sales volume show that demand for these items remained stable. This should be considered alongside external factors, such as product availability, advertising performance, staff efficiency, and in-shop product presentation, all of which play a defining role in sales performance.

The categories most responsible for changes in sales are Coffee and Tea, in first and second place, respectively, followed by Bakery, Drinking Chocolate, and Flavours, though these latter categories exert a much smaller influence.

A comparison of the three graphs reveals some differences across locations: Coffee performs best in the Hell's Kitchen location; Tea achieves its highest sales in the Astoria location; Bakery performs similarly across all three locations; and Flavours perform best in the Lower Manhattan location but worst in Astoria.





## Customer Purchasing Patterns

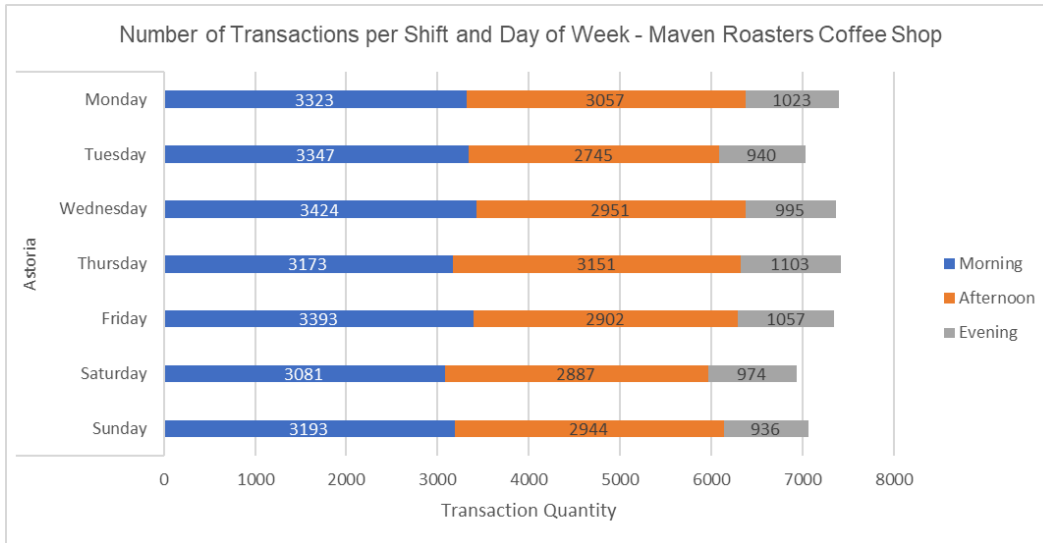
As mentioned at the beginning of the report, data limitations can affect the accuracy of insights related to customer behavior, preferences, and less popular products. These observations may also be influenced by factors such as inventory shortages, staff errors in product offerings, product placement, or mishandling of the management system, as well as poor service impacting customer loyalty, among others. Therefore, the results presented here are based solely on the available data.

### Across Days of Week and Shifts

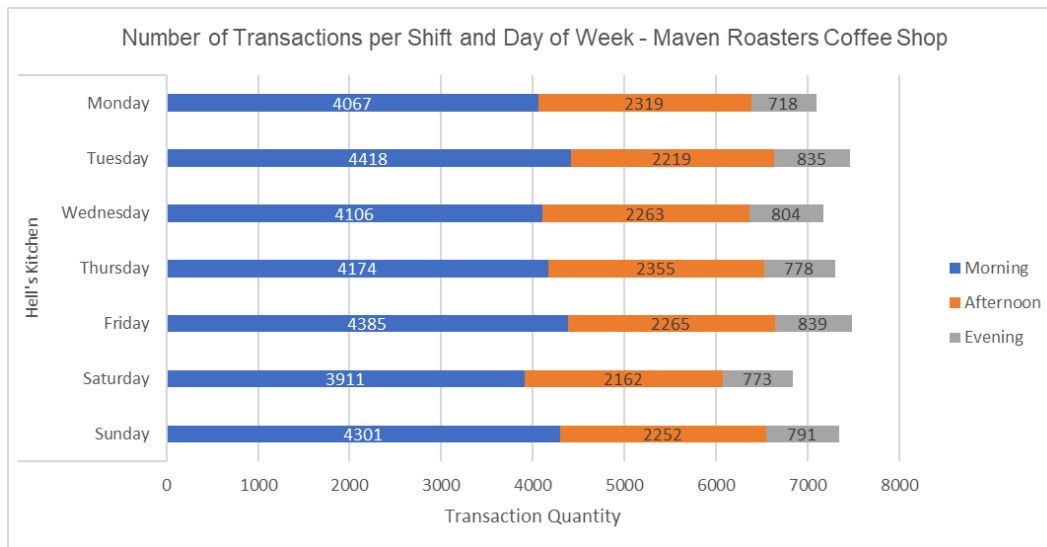
An analysis of customer activity throughout the week reveals no consistent pattern for specific weekdays or weekends, in any month under analysis. This lack of a clear pattern holds true across both warmer and colder months, indicating that day-of-week behavior is variable and does not follow a predictable trend.

When examining purchase behavior by shift, all three shop locations exhibit similar daily patterns. Activity typically peaks in the morning, drops around noon, and then picks up again in the afternoon, though not reaching the same level as the morning rush. Evenings show a significant decline in transactions, with very limited activity across all locations.

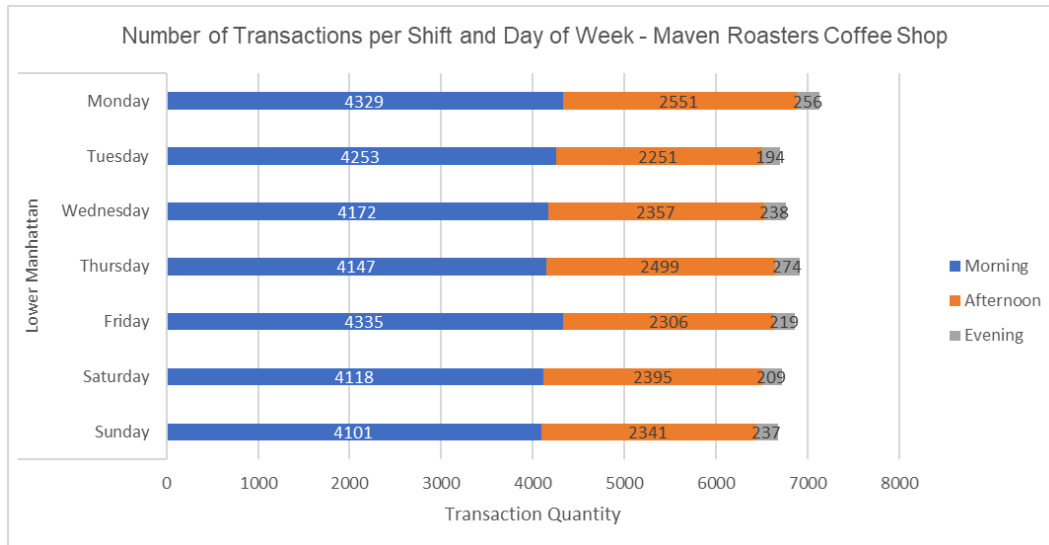
Slight variations emerge between locations. In the Astoria location, the number of transactions is relatively similar between the morning and the afternoon, with a slightly higher volume of sales in the morning.



In contrast, both the Hell's Kitchen and Lower Manhattan locations show a higher number of customers in the morning across all months analyzed, indicating a more pronounced pattern of early-day purchases in these areas.

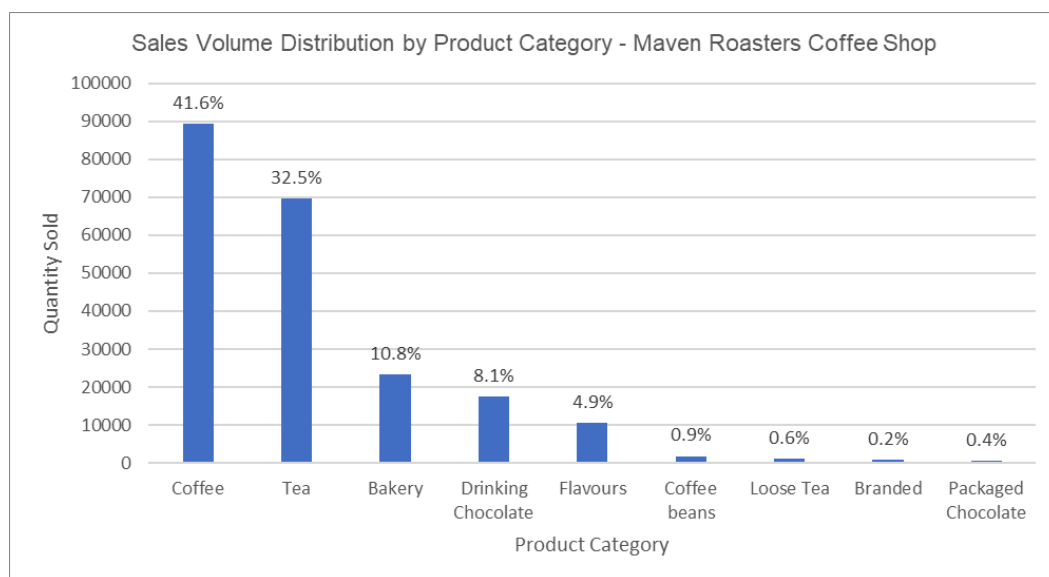


What distinguishes the Lower Manhattan location from Hell's Kitchen is its significantly lower sales during the evening shift.



### Across Product Categories

Product purchasing patterns analysis based on units sold almost mirrors the revenue distribution. Again, this ranking reflects the monthly product category rankings for each location, with only minor variations that do not provide significant insights.



Coffee is the top-selling category, accounting for 42% of total sales volume. Tea follows at ~80% of Coffee's volume, representing 33% of total sales.

Bakery accounts for 11% of total sales volume, a sharp drop compared to Coffee and Tea. This suggests that customers often consume beverages on their own rather than pairing them with baked goods. Comparing total beverage items sold (176,444 units) with Bakery items (23,214 units) shows that at most 13% of beverage purchases could have included a Bakery item. Since some Bakery items are likely purchased alone, the actual pairing rate may be even lower.



Drinking Chocolate emerges as the least purchased beverage. Also, flavored drinks are not a strong seller, since comparing the total number of beverages sold (176,444 units) to the number of Flavours (10,511 units), only 6% of drinks included an added flavour.

Similarly, the Branded and “beverage preparations” categories (beverage preparations include Coffee Beans, Loose Tea, and Packaged Chocolate) are among the least purchased, with Packaged Chocolate being the poorest-performing product category overall. This may suggest a customer preference for ready-to-drink items over at-home preparations, or possibly a lack of brand awareness or appeal for these specific products.

### Within Product Categories

Across all locations, sales within each product category are generally consistent. However, individual locations exhibit distinct top performers and underperformers within those categories. Below is a breakdown of purchasing patterns by location:

#### ➤ Astoria

- Coffee sales are led by the Ethiopia Small. In contrast, the Ouro Brasileiro Shot shows no sales at all.
- The Tea category reveals no significant variation, with all varieties selling in similar volumes.
- For Drinking Chocolate, colder months do not reveal stronger sales. However, as summer approaches, sales of the Dark Chocolate variant increase, suggesting a seasonal trend.
- Regarding flavoured beverages, Chocolate Syrup is the top seller, though other options are also moderately selected.
- In the Bakery category, the Chocolate Croissant stands out as the bestseller, closely followed by the Scottish Cream Scone.
- Ethiopia in the Coffee Beans category is the main seller, mirroring the trend in ready-to-drink coffee.
- For the Loose Tea category, Peppermint is the clear best performer.
- Dark Chocolate in the Packaged Chocolate category records the lowest sales, supporting the hypothesis that customers may either lack interest in preparing chocolate beverages at home or in the office, or may simply be unaware of the product.
- Lastly, in the Branded category, the Latte Cup stands out as the most popular item.

#### ➤ Hell's Kitchen

- In this location, the most popular ready-to-drink Coffee is the Ouro Brasileiro Shot, differing greatly from Astoria's preference.
- The Tea, Drinking Chocolate, and Flavour categories show a balanced distribution of sales, with no single product dominating.

- The Chocolate Croissant again leads in the Bakery section, followed by the Scottish Cream Scone, replicating the trend seen in Astoria.
  - In Coffee Beans, Civet Cat is the standout, accounting for approximately 20% of sales in this category, a significant lead over the nine other options.
  - The Peppermint type is also the top choice for Loose Tea, aligning with customer preferences in Astoria.
  - Packaged Chocolate sales are steady across items, with no single product dominating.
  - In the Branded category, performance is weaker in comparison to the other locations, representing only 18% of the total Branded item sales across all three locations. Clothing and Dinner Mugs are the least sold items.
- Lower Manhattan
- This location shows balanced sales across all types of ready-to-drink Coffee and Tea.
  - For Drinking Chocolate, the Dark Chocolate Large option is the most popular.
  - Sugar-Free Syrup is the top choice within the Flavours category, setting this location's Flavour performance apart from the other two.
  - The Bakery section again highlights the Chocolate Croissant as the leading item, with Ginger Scones uniquely standing out as the second in sales in this location.
  - Brazilian Organic beans lead in the Coffee Beans category, with stronger sales during warmer months.
  - Serenity Green Tea is the favorite Loose Tea, differing from the Peppermint trend in Astoria and Hell's Kitchen.
  - In the Packaged Chocolate category, the top performer is the Sustainably Grown Chocolate.
  - Lastly, the Branded category performs best in this location, with the highest number of units sold across all three locations and relatively equal distribution among the available items.

In terms of revenue, there are no significant spikes or drops that indicate stronger or weaker sales to specific items. Higher revenue figures are generally the result of higher-priced products, while lower revenue is associated with lower-priced items, rather than differences in customer demand.

### **Addressing the February Drop**

The consistent decline and subsequent increase in revenue and sales across all locations suggest that the same factors may be affecting all three shops equally.

The analysis shows that Coffee and Tea purchases are the primary drivers of sales trends, followed by Bakery, Drinking Chocolate, and Flavours. Therefore, changes in the consumption of these categories may hold the key to understanding the observed patterns.

As noted at the start of the report, the existing data limitations highlight the need for additional internal data (such as staff and labor data, inventory or stock information, customer feedback, equipment and supply chain details, advertising performance, and comprehensive operational efficiency metrics,) as well as relevant external data, including post-Christmas consumer patterns, seasonal downturns, summer tourism increases, and weather conditions. Collecting this information may be essential to fully explain the sharp drop in commercial activity observed in February and the significant increase during the summer across these three locations.

### **Price Inconsistencies**

Analysis revealed recurring price inconsistencies across all three locations. Certain products were recorded with two or more distinct unit prices, typically higher than the standard, without any consistent pattern suggesting discounts or price increases. Most cases occurred in the morning.

- Lower Manhattan has the highest incidence, with twelve affected items, mainly in the Bakery category: Hazelnut Biscotti, Ginger Biscotti, Chocolate Chip Biscotti, Croissant, Chocolate Croissant, Almond Croissant, Scottish Cream Scone, Cranberry Scone, Ginger Scone, Jumbo Savory Scone, plus Ouro Brasileiro Shot Coffee and Organic Decaf Blend Coffee Beans.
- Astoria has three affected items, all in the Branded category: I Need My Bean! T-shirt, I Need My Bean! Diner Mug, and I Need My Bean! Latte Cup.
- Hell's Kitchen has two affected items: Ginger Scone, and Ouro Brasileiro Shot Coffee.

Due to the data limitations outlined at the beginning of the report, the cause of these discrepancies cannot be determined. Possible explanations could include staff errors, system issues, or pricing policies that adjust prices based on certain conditions. Further investigation is recommended to prevent revenue loss and safeguard business performance.

## **MARKETING RECOMMENDATIONS**

Based on the data used in this analysis, the following marketing recommendations are proposed to increase the average spend per transaction and enhance overall brand awareness.

### **Solving Price Inconsistencies**

A key driver of strong performance is the efficiency and seamless operation of all processes that keep the business running and thriving. Identifying the root cause of price inconsistencies and resolving it is essential to building and sustaining long-term success.

### **Advertising strategies**

Combined strategies both physical and digital will be most effective in driving sales. Examples include:

- Eye-catching in-shop and, if budget permitting, on the street physical advertisements.
- Sales personnel strategy of suggesting meals or combo options.
- Targeted social media content designed to encourage engagement and community around the brand.

### **Seasonal Focus**

Autumn and winter, especially February, are key periods for marketing efforts. Specific recommendations include:

- Integrate delivery platforms such as UberEats and DoorDash to cater to customers reluctant to go out in cold weather. Target workplaces and residential areas.
- Promote hot drinks as comforting options for cold days.
- Highlight warm Bakery items to drive sales in this category.
- Launch a winter loyalty campaign featuring:
  - Discounts and seasonal combo offers.
  - Points accumulation for benefits such as free delivery.
  - Special promotions on popular items at each shop location.

In warmer months, the products could also be adapted by offering cold beverages to encourage consumption.

### **Combo Promotions**

Encourage meal creation by bundling beverages with bakery items. Suggested strategies:

- Offer discounted combos that pair low-performing beverages with popular bakery items, and vice versa.
- Use advertisements and social media to showcase customers enjoying these combos.

### **Drinking Chocolate Strategy**

Drinking Chocolate has year-round potential:

- Promote hot versions during autumn and winter.
- Introduce cold variations in spring and summer.
- Suggest ideal bakery pairings to position it as a satisfying snack or small meal.

## **Flavored Beverages**

Boost sales of Flavours category with attractive, seasonal drink options. Ideas include:

- Feature beverages such as caramel latte, sugar-free vanilla latte, double chocolate cappuccino, and hazelnut Drinking Chocolate.
- Explore tea-based flavored drinks.
- Pair flavored beverages with bakery items to increase transaction value.

## **Beverage Preparations**

Promote beverage preparations categories items (Coffee Beans, Loose Tea, and Packaged Chocolate) through:

- Recipe-based content and consumption ideas on social media.
- Occasional giveaways tied to combo purchases or social engagement.

## **Branded Merchandise**

Performance varies by location: strong in Lower Manhattan, weak in Hell's Kitchen. Since the dataset does not reveal the cause of underperformance (visibility, pricing, or customer preference), strategies should be tested:

- Strong-performing locations: Leverage existing demand with bundle deals (for example, "Buy 3 mugs, get 1 free") or discounts tied to popular items like Coffee Beans. Encourage social media engagement (for example, customers tagging the brand).
- Low-performing locations: Pilot strategies such as in-shop placement, ads highlighting product use, and targeted social media campaigns. Monitor results to identify the most effective lever before scaling.

## **Day-Based Strategies**

Although sales data shows no significant differences between weekdays and weekends, promotions can still be segmented this way since customer routines typically do not differ (workdays and leisure days). The goal would be to test whether these campaigns can create patterns that currently don't exist.

- Weekend promotions: Group combos or discounts aimed at increasing foot traffic on leisure days.
- Weekday promotions: Incentivize transaction value by advertising easy-to-grab meals ideal for busy routines or energy boosts during breaks.

## **Evening Opportunities**

Evenings currently show the lowest activity across all locations. Since the shops are already open during these hours, testing evening-focused offers may help capture untapped demand, such as:

- Introducing savory options and juices to form complete meals suitable for dinner, and also for lunch.
- Rebranding current items as "night treats" for customers who stay active during late hours, or for those who want a dessert after dinner.
- Promoting these offerings through delivery platforms like UberEats and DoorDash.

If sales remain weak despite these efforts, a cost-benefit evaluation of evening operations should be considered.