## Section 1: The KPIs

**KPI Description (in words):** 1. Total Sales per store.

**KPI formula:** Sum (Value), per store

**Steps to realize KPI:**

1)
```
SELECT store_code, SUM(value) AS Total_sales
FROM receipt_lines,receipts
WHERE receipt_lines.receipt_id=receipts.receipt_id
GROUP BY store_code
ORDER BY 2 DESC;
```

2) Visualized via Tableau as graph titled "Total Sales per store". See the Tableau file.

3) Data underpins Figure 2 in the comparative analysis.

**Additional Notes:** None.

**KPI Description (in words):** 2. Average Transaction Value per store.

**KPI formula:** Average(Value),per store

**Steps to realize KPI:**

1)
```
SELECT store_code, AVG(value) AS avg_transaction_value
FROM receipt_lines,receipts
WHERE receipt_lines.receipt_id=receipts.receipt_id
GROUP BY store_code
ORDER BY 2 DESC;
```

**Additional Notes:** None.

**KPI Description (in words):** 3. Active Customers: Distinct Customer count per month per store.

**KPI formula:** Count (Distinct customer_id),per month,per store

**Steps to realize KPI:**

1)
```
SELECT COUNT (DISTINCT customer_id) as active_customers,
date_trunc('month',purchased_at),store_code
FROM receipts
GROUP BY 2,3
ORDER BY 3 DESC;
```

2) ) Visualized via Tableau as graph titled " Distinct Customer per month per store". See the Tableau file.

3) Data underpins Figure 5 in the comparative analysis.

**Additional Notes:** None.

**KPI Description (in words):** 4. Count of repeat customers per month for all the 4 stores.

**KPI formula:** Count(customer_id), per store, per month

**Steps to realize KPI:**

1) SELECT date_format(month,'yyyy-MM') as mth, store_code,count(*)
from (
SELECT customer_id,date_trunc('month',purchased_at) as month,store_code
FROM receipts
GROUP BY 1,2,3
HAVING count (DISTINCT receipt_id)>1
)
GROUP BY 1,2
ORDER BY 3 DESC;

**Additional Notes:** Assuming customer repeating on the same day

**KPI Description (in words):** 5. Count of new customers per month per store.

**KPI formula:** Count(customer_id), per store, per month, MIN(purchased_at)

**Steps to realize KPI:**

1) SELECT date_format(first_month,'yyyy-MM'),COUNT(*),store_code
FROM
(
SELECT customer_id,date_trunc('month',MIN(purchased_at)) as first_month,store_code
FROM receipts
GROUP BY 1,3
)
GROUP BY 1,3
ORDER BY 2 DESC;

**Additional Notes:** Considering that customer who is new has the minimum purchased date compared to old customers.

**KPI Description (in words):** 6. Customer Lifetime Value (CLV)

**KPI formula:** Sum (Value), per customer, per store

**Steps to realize KPI:**

1) SELECT store_code, customer_id, SUM(value) AS customer_lifetime_value
FROM receipt_lines,receipts
WHERE receipt_lines.receipt_id=receipts.receipt_id
GROUP BY store_code, customer_id
ORDER BY 3 DESC;

**Additional Notes:** Assuming CLV as the total revenue from a customer over their lifetime.

**KPI Description (in words):** 7. High-Value Customers

**KPI formula:** Sum (Value), per store, per customer

**Steps to realize KPI:**

1) SELECT store_code, customer_id, SUM(value) AS total_spend
FROM receipt_lines,receipts
WHERE receipt_lines.receipt_id=receipts.receipt_id
GROUP BY store_code, customer_id
HAVING SUM(value) >= AVG(value)
ORDER BY 3 DESC;

**Additional Notes:** None.

**KPI Description (in words):** 8. Low-Value Customers.

**KPI formula:** Sum (Value), per store, per customer

**Steps to realize KPI:**

1) SELECT store_code, customer_id, SUM(value) AS total_spend
FROM receipt_lines,receipts
WHERE receipt_lines.receipt_id=receipts.receipt_id
GROUP BY store_code, customer_id
HAVING SUM(value) < AVG(value);

**Additional Notes:** None.

**KPI Description (in words):** 9. Number of loyal customers per month per store.

**KPI formula:** Count (Customer_id),per store, per month

**Steps to realize KPI:**

1)
SELECT year_month, store_code,COUNT(*)
FROM (
  SELECT customer_id, DATE_TRUNC('month',purchased_at) as year_month,store_code
  FROM receipts
  GROUP BY 1, 2,3
  HAVING COUNT( DISTINCT purchased_at ) >= 3
) x
GROUP BY year_month,2
ORDER BY 3 DESC;

**Additional Notes:** A loyal customer is defined as someone who purchases on at least 3 distinct days.

**KPI Description (in words):** 10. Best-Selling products.

**KPI formula:** Count(receipt_id), per store, per product, per product details

**Steps to realize KPI:**

1) SELECT store_code, products.product_code, COUNT(receipts.receipt_id) AS sales_count,product_details
FROM receipt_lines,products,receipts
WHERE receipt_lines.receipt_id=receipts.receipt_id
AND receipt_lines.product_code=products.product_code
GROUP BY store_code, products.product_code,product_details
ORDER BY sales_count DESC;

**Additional Notes:** None.

**KPI Description (in words):** 11. Customer Engagement by Product.

**KPI formula:** Count (DISTINCT Customer_id), per product

**Steps to realize KPI:**

1) SELECT product_code,COUNT(DISTINCT customer_id) AS unique_customers
FROM receipt_lines,receipts
WHERE receipt_lines.receipt_id=receipts.receipt_id
GROUP BY product_code
ORDER BY 2 DESC

**Additional Notes:** Number of unique customers who purchased each product.

**KPI Description (in words):** 12. Department Contribution to Overall Sales.

**KPI formula:** Sum (Value), per department

**Steps to realize KPI:**

1) SELECT sum(value) AS category_sales,department_name
FROM receipt_lines,receipts,products
WHERE receipt_lines.receipt_id=receipts.receipt_id
AND receipt_lines.product_code=products.product_code
GROUP BY department_name
ORDER BY 1 DESC
2) Visualized via Tableau as graph titled "Department Contribution to overall Sales". See the Tableau file.
3) Data underpins Figure 6 in the comparative analysis.

**Additional Notes:** None.

**KPI Description (in words):** 13. Average Quantity Sold per Transaction by Product-TOP 5

**KPI formula:** Average(qty), per product

**Steps to realize KPI:**

1) SELECT product_code,AVG(qty) AS avg_quantity_per_transaction
FROM receipt_lines
GROUP BY product_code
ORDER BY 2 DESC
LIMIT 5;

2) Visualized via Tableau as graph titled "Average Quantity per Product ". See the Tableau file.

3) Data underpins Figure 3 in the comparative analysis.

**Additional Notes:** None.

**KPI Description (in words):** 14. Top 5 Best-Selling Products by Total Units Sold.

**KPI formula:** Sum (Qty), per product

**Steps to realize KPI:**

1) SELECT product_code,SUM(qty) AS units_sold
FROM receipt_lines
GROUP BY product_code
ORDER BY 2 DESC
LIMIT 5;

2)Visualized via Tableau as graph titled "Top 5 Best-Selling Products". See the Tableau file.

3) Data underpins Figure 4 in the comparative analysis.

**Additional Notes:** None.

**KPI Description (in words):** 15. Products per Store.

**KPI formula:** Count(Distinct product_code),per store

**Steps to realize KPI:**

1) SELECT store_code, COUNT(DISTINCT product_code) AS products_per_store
FROM receipts,receipt_lines
WHERE receipt_lines.receipt_id=receipts.receipt_id
GROUP BY store_code
ORDER BY 2 DESC;

2) Visualized via Tableau as graph titled "Products per store". See the Tableau file.

3) Data underpins Figure 1 in the comparative analysis.

**Additional Notes:** Assume that store size is related to the number of products offered in each store.

**KPI Description (in words):** 16. Average quantity sold per store

**KPI formula:** Count(Distinct product_code),per store

**Steps to realize KPI:**

1) SELECT
store_code,
AVG(qty) AS avg_quantity_sold_per_store
FROM
receipt_lines,receipts
WHERE receipt_lines.receipt_id=receipts.receipt_id
GROUP BY store_code
ORDER BY 2 desc;

2) Visualized via Tableau as graph titled " Average quantity sold per store". See the Tableau file.

**Additional Notes:** None.

## Section 2: Comparative Analysis
(including recommendations)

FoodCorp is a growing retail company with four stores in different cities in the UK, seeks to optimize its marketing strategies by understanding the regional performance of its stores. This comprehensive comparative analysis explores various KPIs to provide insights into customer behaviour, sales performance, and growth opportunities across different locations.

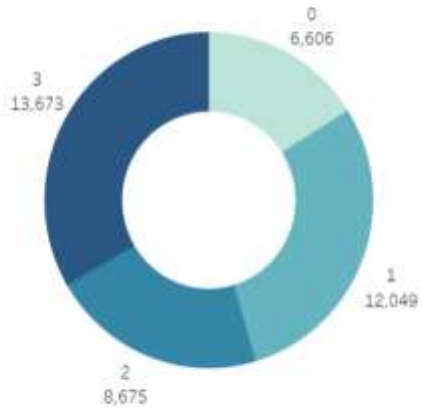


Fig.1 Products per Store


Fig.2 Total sales per Store

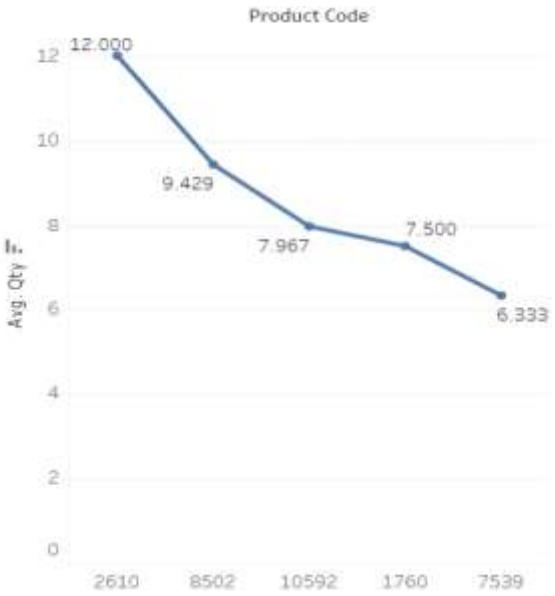


Fig.3 Average Quantity Sold per Transaction by Product


Fig.4 Top 5 Best Selling Products

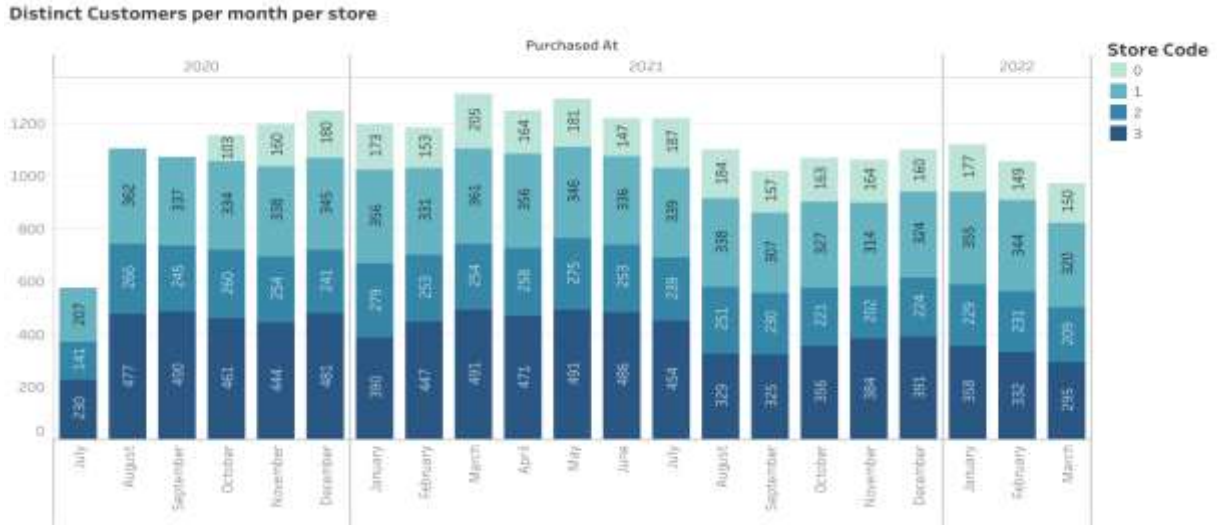


Fig.5 Distinct Customers per month per store

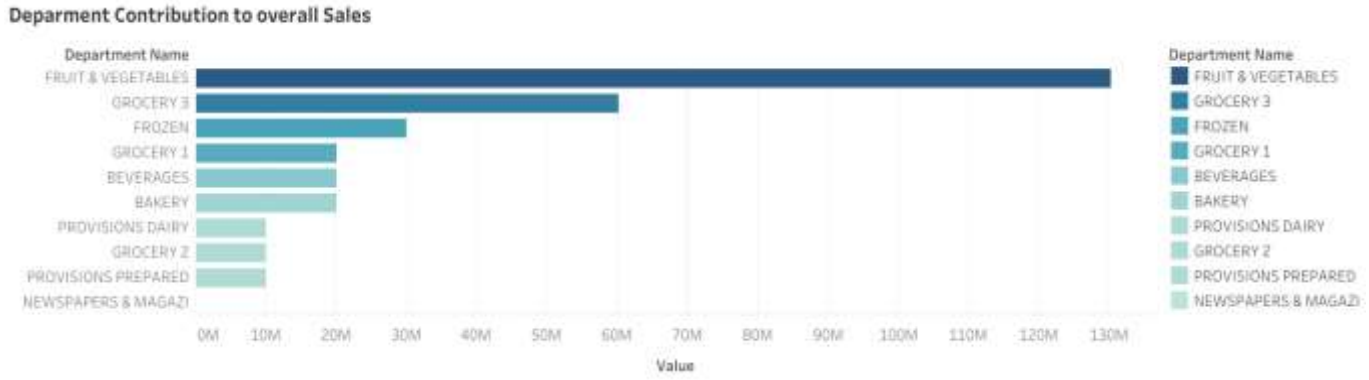


Fig.6 Department contribution to Overall Sales

Following are key valuable insights into the performance of FoodCorp's stores:

**1. Analysing the Customer Base:**

1. London (300 Oxford St): The analysis reveals that this store has the highest count of active customers (Refer Fig. 5), repeat customers, and new customers. It also exhibits a substantial customer lifetime value, suggesting strong engagement and also has the maximum count of loyal customers.
2. Birmingham: This store stands out for having the most repeat customers in January 2021, showcasing a loyal customer base. The count of repeat customers and new customers indicates positive customer dynamics.
3. Nottingham: Nottingham emerges as a store with the highest total sales(Refer Fig.2)
   But has minimum number of active customers, repeat customers and new customers.
4. London (Lowndes Square): It has lowest total sales compared to other stores. It has a little better count than Nottingham store with respect to customer related metrics like new customers, repeat customers and loyal customers.

**2. Consideration of General Performance Statistics:**

1. Nottingham: While having the highest total sales, this store also demonstrates the highest average transaction value, suggesting that customers are willing to spend more per transaction. It has the minimum number of products per store.
2. Birmingham: The store contributes significantly to overall sales, particularly in the Fruit and Vegetables department (Refer Fig.6), showcasing its performance in specific product categories.

It has second most number of products. It has highest average quantity sold per transaction.(Refer Fig.3)

3. London (300 Oxford St): The assumption that store size is related to the number of products is supported by this store having the highest number of products per store (Refer Fig.1).It also has highest average quantity sold and the least is in Nottingham.
4. London (Lowndes Square): It has minimum number of products but still has more count of products compared to store at Nottingham.

**3. Varying Store Sizes:**

1. Nottingham: The store with the highest total sales and average transaction value also tops in customer lifetime value and is a prime attraction for high value customers. And contributing the maximum in departmental sales count with the top category of Fruits and Vegetables.
2. Birmingham: While being second in store size, the store's contribution to overall sales and departmental performance suggests a substantial presence. Product Performance Metrics gives information of the product that has the highest sales and is from this store (Refer Fig.4).
3. London (300 Oxford St): The store with the highest number of products per store, potentially indicating a larger store size and a broader product range.
4. London (Lowndes Square): Assuming CLV or Customer Lifetime value as the total revenue from a customer over their lifetime then this store has the minimum value compared to all the other stores.

**4. Identifying Growth Opportunities:**

1. London (300 Oxford St): Opportunities for growth lie in leveraging the store's high customer engagement, repeat business, and new customer acquisition. Tailored marketing campaigns can capitalize on these strengths.
2. Birmingham: This store, with a notable count of repeat customers, presents an opportunity for strategic marketing to further enhance customer loyalty and potentially attract new customers.
3. Nottingham: Identified as a store with significant total sales, there is potential for further growth by targeting high-value customers and expanding the product range.
4. London (Lowndes Square): Evaluate the performance against other stores, aim for improvement in capturing a strong customer base as well general performance statistics.

**5. Recommendations for maximizing growth and overall performance:**

1. London (300 Oxford St):
   - Strengths: This store exhibits the highest count of active customers, repeat customers, and new customers. It also has a substantial customer lifetime value, indicating strong customer engagement. With the highest number of products per store and maximum average quantity sold, it potentially signifies a larger store size and a broader product range for sale.
   - Opportunities for Growth: Leverage high customer engagement and repeat business to tailor marketing campaigns. Attract new customers through targeted strategies.
   - Recommendations: Focus on enhancing customer engagement through personalized marketing strategies. Capitalize on the store's strengths in repeat business and new customer acquisition thereby increasing the total revenue.

2. Birmingham:
   - Strengths: Birmingham stands out for having the most repeat customers in January 2021, showcasing a loyal customer base. It contributes significantly to overall sales, particularly in the Fruit and Vegetables department. With the second-highest number of products per store, it indicates a substantial presence.
   - Opportunities for Growth: Strategically market to enhance customer loyalty further. Leverage the store's performance in specific product categories for targeted growth.

- Recommendations: Strengthen customer loyalty programs and consider targeted marketing initiatives to attract new customers.

3. Nottingham:
   - Strengths: This store has the highest total sales and average transaction value, suggesting that customers are willing to spend more per transaction. It also has the highest customer lifetime value, making it a prime attraction for high-value customers.
   - Opportunities for Growth: Target high-value customers and consider expanding the product range to tap into the store's potential for further growth.
   - Recommendations: Target high-value customers with tailored promotions and explore opportunities for expanding the product range.

4. London (Lowndes Square):
   - Strengths: While having the lowest total sales compared to other stores, it has a relatively better count of products compared to the Nottingham store. However, it has the minimum number of products among all stores.
   - Opportunities for Growth: Evaluate the performance against other stores, identify areas of improvement, and consider tailored marketing strategies for this location.
   - Recommendations: Analyse the performance against other stores, identify areas for improvement, and design customized marketing campaigns accordingly.

**Conclusion of the Analysis:**

1.If the goal is to maximize overall sales and target high-value customers, Nottingham could be the preferred choice.

2.If the focus is on customer loyalty and specific product categories, Birmingham presents a strong option.

3.For conducting the campaign that provides the best growth opportunities, customer engagement, attracting new customers, and promoting a broad product range, London (300 Oxford St) would be the ideal choice.

4.London (Lowndes Square) could be considered with targeted strategies to address specific areas of improvement.