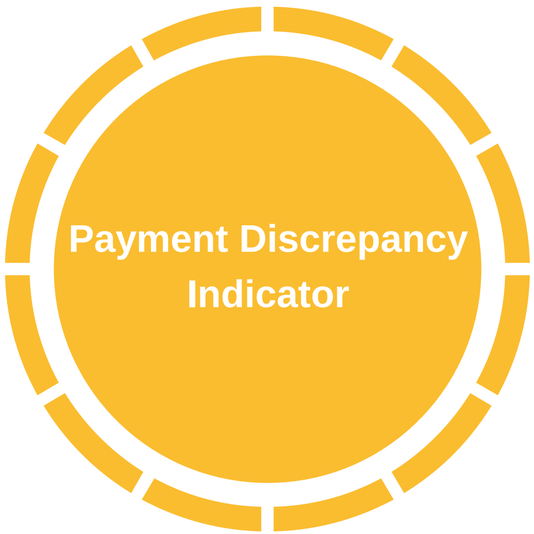
# Instacart BI Reporting Challenge

Joseph Lin

# Understanding Scope and Magnitude of Discrepancies

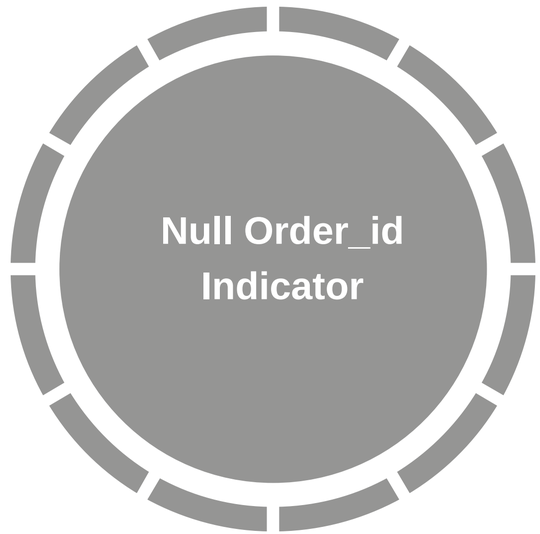
Metrics that help capture our issues


Total number of orders in Total Order_Fulfillment table with mismatching In_Store_Payment_amount and Total_Amount from POS_Transactions table




Percent of all orders in Order_Fulfillment table with mismatching In_Store_Payment_Amount and Total_Amount from POS_Transactions table


Total Number of POS Transactions in POS_Transactions table with missing Order_id, essentially all the POS transactions that were not able to be reconciliated with an Instacart Order




Percent of all POS transactions that were not able to be reconciliated with an Instacart order

# Executive Summary

The introduction of retailer All Food Market in September increased Payment Amount Discrepancies and non-reconcilable POS Transactions

80% of Payment Discrepancies and 100% of Null Order_id's occured in September.

The New York Metro area accounted for a Third of all Payment Discrepancies

And about 25% of all Null Order_id's

Miami and the New York Metro area account for 50% of non-reconcilable POS Transactions

25% occured in Miami and 25% occurred in New York / Brooklyn

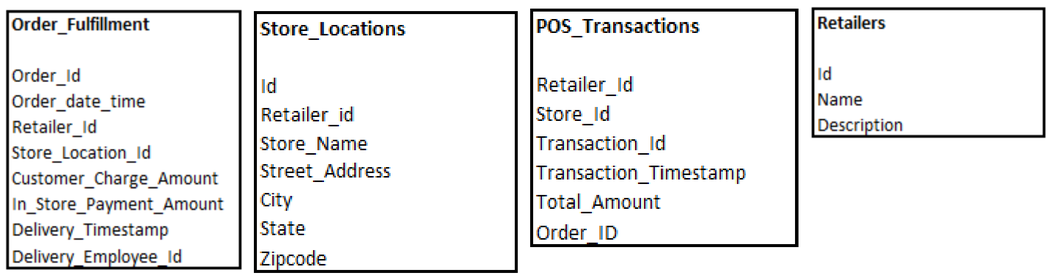
# Data Set

Overview

| Attribute | Measure |
|---|---|
| Total # of Orders | 1080 |
| Range of Order Dates | July 1, 2015 – September 11 ,2015 |
| Top 3 Cities (Orders) | New York, Miami, Brooklyn |
| Payment Discrepancies | 104 |
| Percent of Payment Discrepancies (PDI) | 9.63% |
| Null Order_id's (non-reconcilable POS transactions) | 27 |
| Percent of Null Order_id's (NOI) | 2.48% |

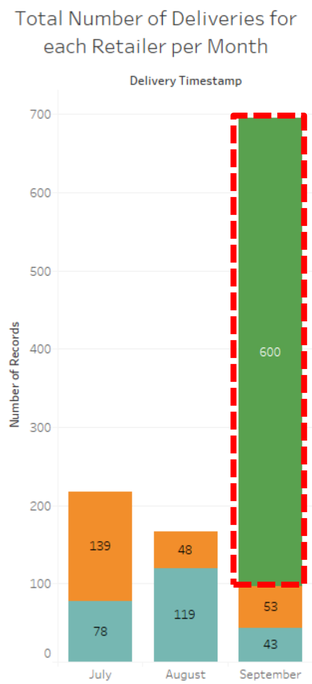
## *Processing the Data*

- The following tables were loaded into a MySQL Database:



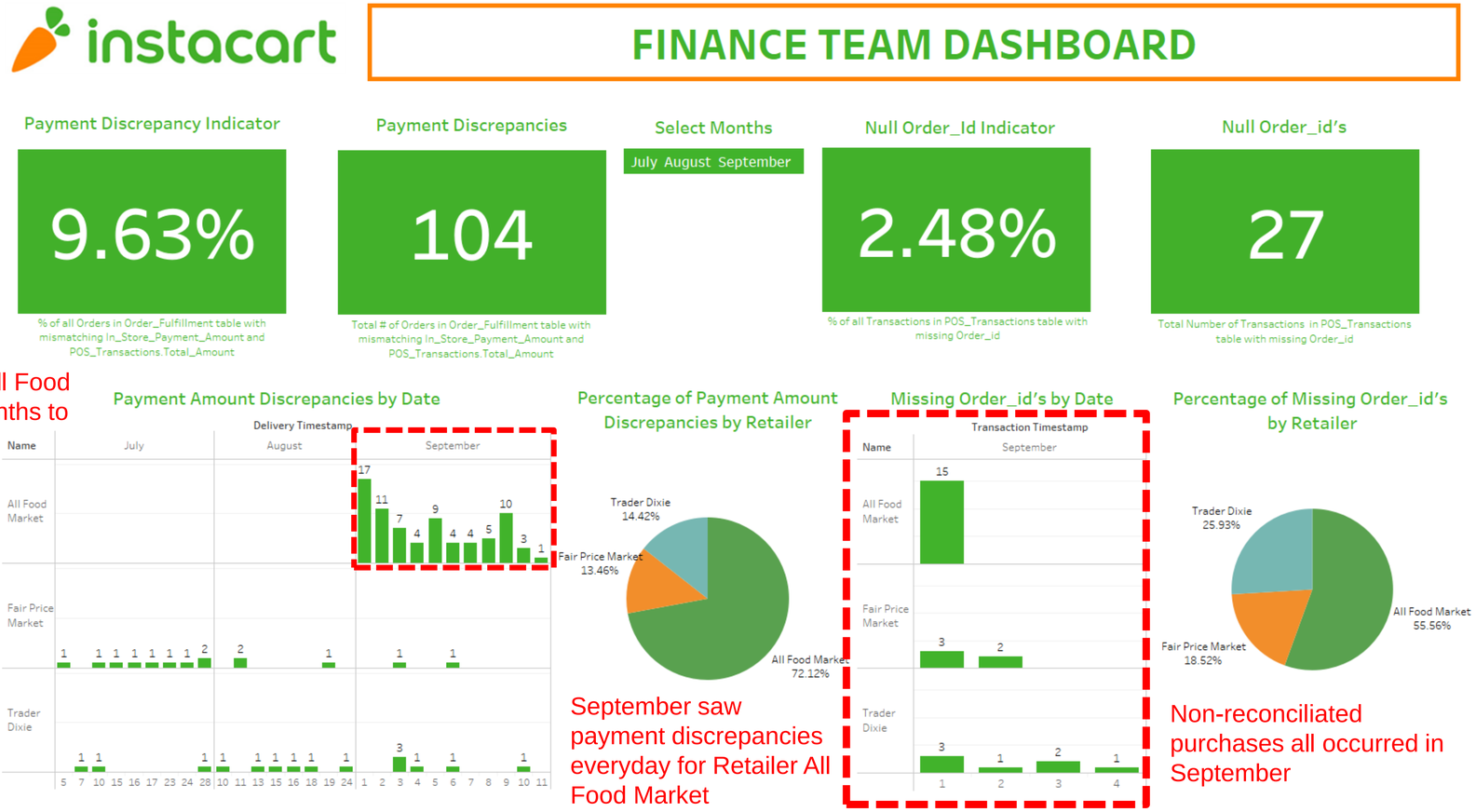

- Then subsequently loaded into Tableau to create the Data Visualizations.
- The queries used to extract the datasets will be shown at the end of this presentation.

# The Introduction of All Food Market in September increased Payment Amount Discrepancies and non-reconcilable POS transactions




No deliveries for All Food Market in prior months to September

**Assumption: Delivery Timestamp is used as the date due it being a more true metric as to when a transaction is fulfilled**




September saw payment discrepancies everyday for Retailer All Food Market

Non-reconciliated purchases all occurred in September

**What do we learn about our retailers?**

Fair Price Market and Trader Dixie all had deliveries in months prior to September, whereas All Food Market appears to have been introduced as a new retailer for deliveries starting in September.

# September Transaction Metrics

September Payment Discrepancy Indicator (PDI) is up from 9.63% Overall

There are 83 September Payment Discrepancies out of a total 104 in the last 3 months

## FINANCE TEAM DASHBOARD

**Payment Discrepancy Indicator**

11.93%

% of all Orders in Order_Fulfillment table with mismatching In_Store_Payment_Amount and POS_Transactions.Total_Amount

**Payment Discrepancies**

83

Total # of Orders in Order_Fulfillment table with mismatching In_Store_Payment_Amount and POS_Transactions.Total_Amount

**Select Months**

July August September

Date Range selected to September

**Null Order_Id Indicator**

3.84%

% of all Transactions in POS_Transactions table with missing Order_id

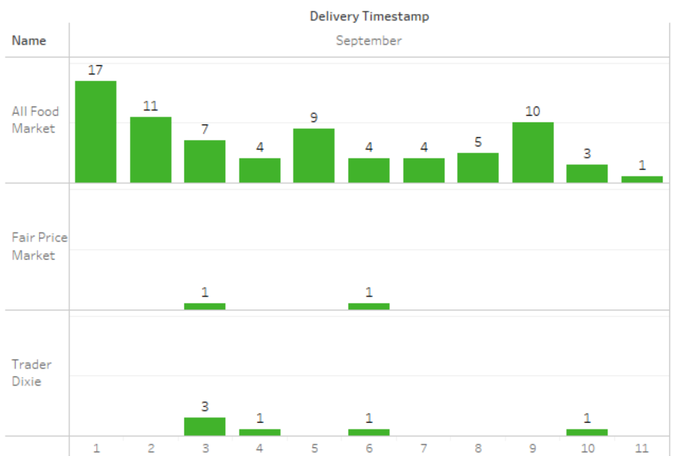
**Null Order_id's**

27

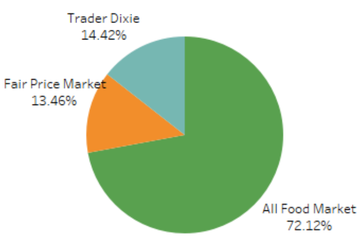
Total Number of Transactions in POS_Transactions table with missing Order_id

Null Order_id Indicator (NOI) is up from 2.48% Overall

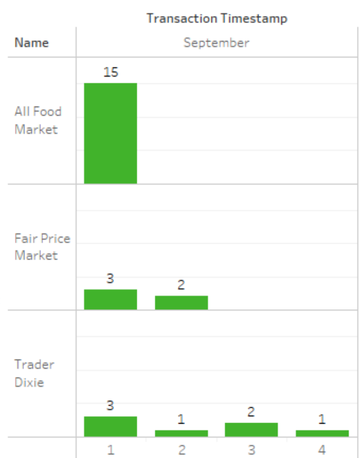
**Payment Amount Discrepancies by Date**



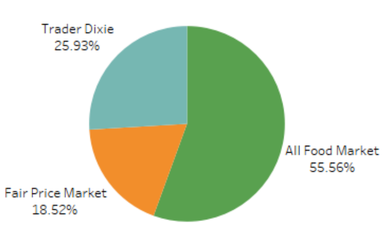

**Percentage of Payment Amount Discrepancies by Retailer**




**Missing Order_id's by Date**



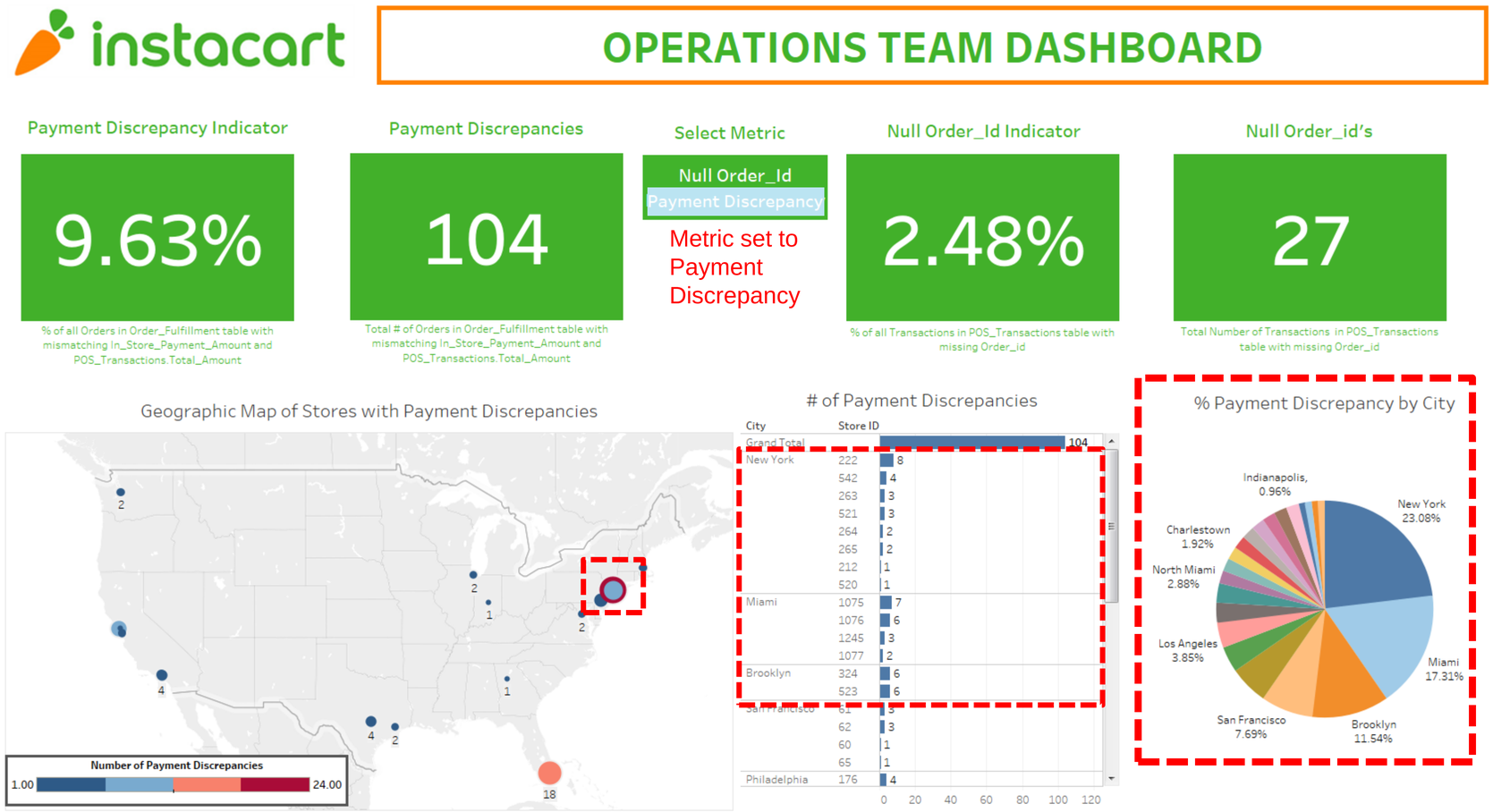

**Percentage of Missing Order_id's by Retailer**




**Key Takeaways:**

With the addition of All Food Market in September, we can observe a sudden spike in Payment Amount Discrepancies and Null Order_id's. The issue could have been caused by a lag in transfer of Order_Fulfillment data, since the missing values all occur sequentially.

# The New York Metro Area accounted for a Third of All Payment Discrepancies




New York with 24 Payment Discrepancies

New York, Brooklyn, Miami account for the largest percentage of Discrepancies

# The New York Metro Area Metrics

September Payment Discrepancy Indicator (PDI) is up from 9.63% Overall

There are 36 Payment Discrepancies in New York / Brooklyn out of a total 104 in the last 3 months

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## OPERATIONS TEAM DASHBOARD

**Payment Discrepancy Indicator**

9.94%

% of all Orders in Order_Fulfillment table with mismatching In_Store_Payment_Amount and POS_Transactions.Total_Amount

**Payment Discrepancies**

36

Total # of Orders in Order_Fulfillment table with mismatching In_Store_Payment_Amount and POS_Transactions.Total_Amount

**Select Metric**

Null Order_Id
Payment Discrepancy

Metric selected to Payment Discrepancy

**Null Order_Id Indicator**

1.69%

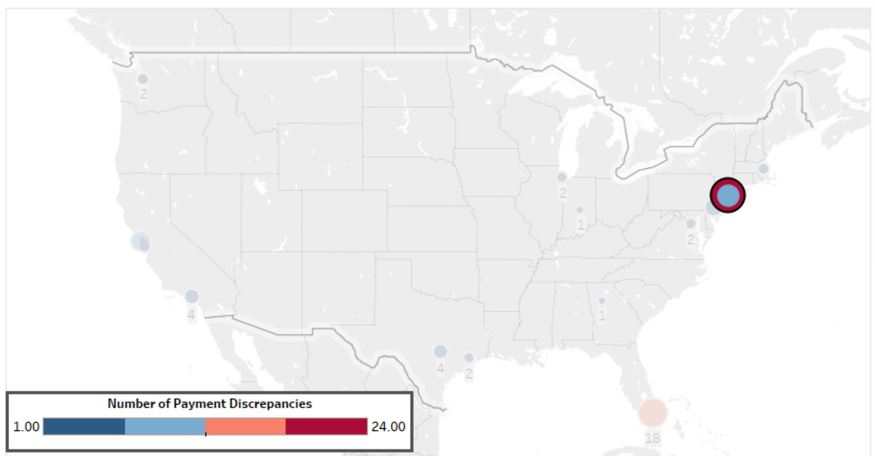
% of all Transactions in POS_Transactions table with missing Order_id

**Null Order_id's**

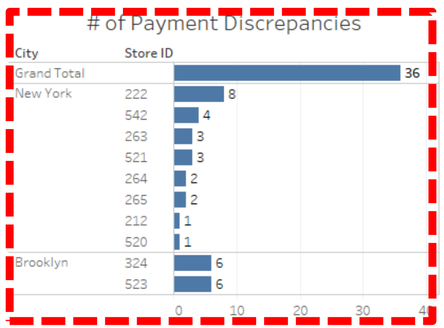
6

Total Number of Transactions in POS_Transactions table with missing Order_id

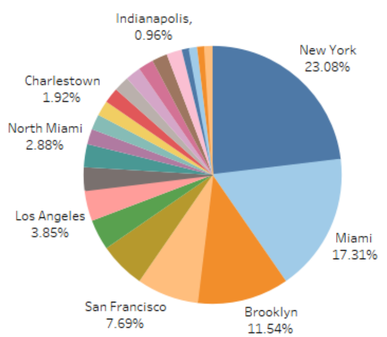
Geographic Map of Stores with Payment Discrepancies




# of Payment Discrepancies



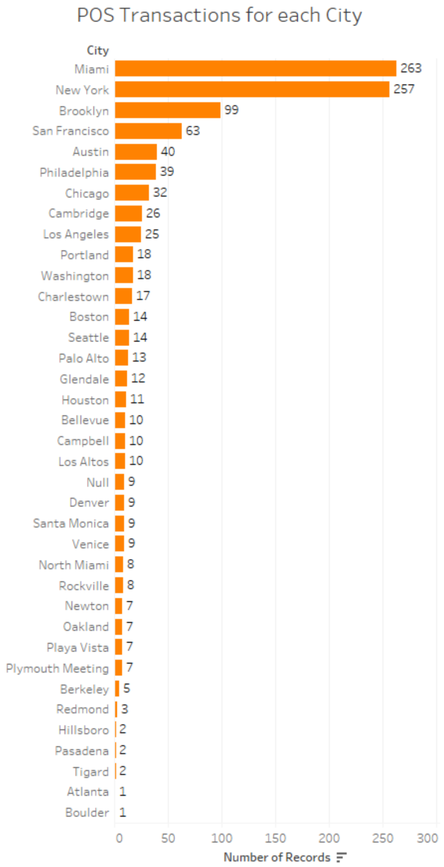

% Payment Discrepancy by City




**Key Takeaway:**

With 35% of all Payment Discrepancies occurring in the New York Metro Area, the Operations team should focus ground efforts to see what are causing the issues in this region.

# Non-reconcilable POS Transaction Metrics




POS Transactions are greatest in Miami and New York / Brooklyn

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## OPERATIONS TEAM DASHBOARD

**Payment Discrepancy Indicator**

9.63%

% of all Orders in Order_Fulfillment table with mismatching In_Store_Payment_Amount and POS_Transactions.Total_Amount

**Payment Discrepancies**

104

Total # of Orders in Order_Fulfillment table with mismatching In_Store_Payment_Amount and POS_Transactions.Total_Amount

**Select Metric**

Null Order_Id
Payment Discrepancy

Metric selected to Null Order_Id

**Null Order_Id Indicator**

2.10%

% of all Transactions in POS_Transactions table with missing Order_id

**Null Order_id's**

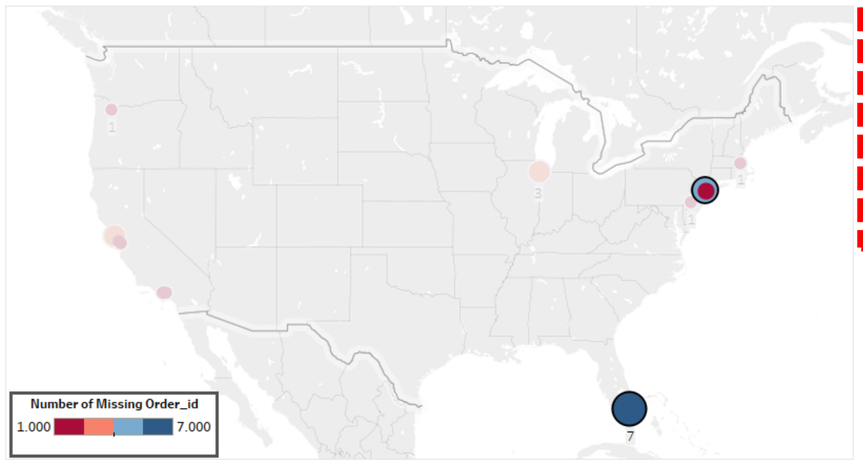
13

Total Number of Transactions in POS_Transactions table with missing Order_id

Null Order_Id Indicator is down from 2.48%, most likely due to the large amount of POS transactions in this region.

There are 13 Null Order_id's out of a total 27 in the last 3 months (~50%) in just Miami and New York / Brooklyn

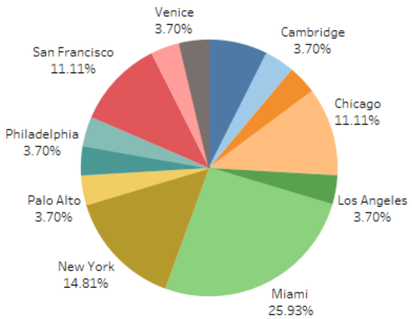
Geographic Map of Stores with Missing Order_id




# of Null Order_id's

| City | Store Id | |
|---|---|---|
| Grand Total | | 13 |
| Brooklyn | 523 | 2 |
| Miami | 1076 | 3 |
| | 1075 | 2 |
| | 1077 | 2 |
| New York | 520 | 2 |
| | 212 | 1 |
| | 521 | 1 |

% Null Order_id's by City




**Key Takeaways:**

Miami, New York, and Brooklyn account for the greatest number of POS Transactions , and will thus see a great number of Null Order_Id's.

# Call To Action

Our Key Takeaways

## A Closer Examination Upon All Food Market

The Finance and Operations Teams should look into what is causing the Payment Discrepancies

## Concentrate efforts in the NYC Metro Area

With as many as 10 million people in this region, Instacart should look to iron out any hardware or technical issues to properly scale the business for optimal growth.

# Assumptions

## *Analysis*

- I noticed that there were sometimes multiple rows in the POS_transactions table from a Customers Order (Order_id), a further look revealed that rows were combined to give final totals, which is why I assume that **all rows that existed were combined to give their totals for each Order_id**, if not then it would result in a payment discrepancy as it would return null in our joined table
- I assumed that **delivery timestamp is reflective of when an order is complete and thus an accurate representation of when an order has been fully processed.** Thus I use delivery timestamp as the date of when payment discrepancies occur.

# Appendix

Contains Dashboards

# OPERATIONS TEAM DASHBOARD

## Payment Discrepancy Indicator

**9.63%**

% of all Orders in Order_Fulfillment table with mismatching In_Store_Payment_Amount and POS_Transactions.Total_Amount

## Payment Discrepancies

**104**

Total # of Orders in Order_Fulfillment table with mismatching In_Store_Payment_Amount and POS_Transactions.Total_Amount

## Select Metric

Null Order_Id

Payment Discrepancy

## Null Order_Id Indicator

**2.48%**

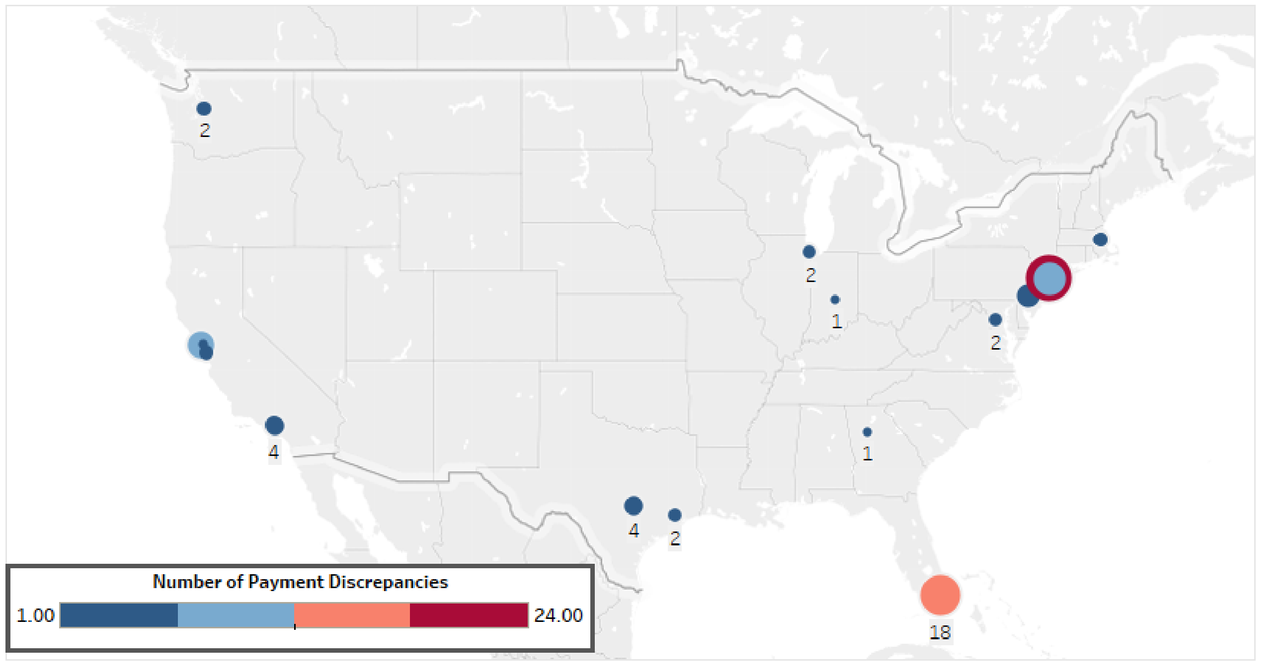
% of all Transactions in POS_Transactions table with missing Order_id

## Null Order_id's

**27**

Total Number of Transactions in POS_Transactions table with missing Order_id

## Geographic Map of Stores with Payment Discrepancies

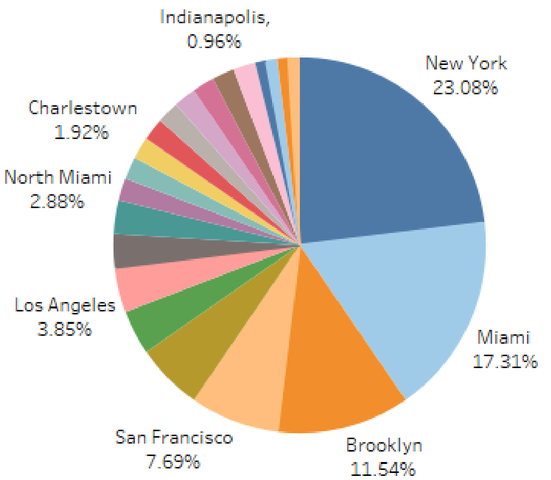



## # of Payment Discrepancies

| City | Store ID | |
|---|---|---|
| Grand Total | | 104 |
| New York | 222 | 8 |
| | 542 | 4 |
| | 263 | 3 |
| | 521 | 3 |
| | 264 | 2 |
| | 265 | 2 |
| | 212 | 1 |
| | 520 | 1 |
| Miami | 1075 | 7 |
| | 1076 | 6 |
| | 1245 | 3 |
| | 1077 | 2 |
| Brooklyn | 324 | 6 |
| | 523 | 6 |
| San Francisco | 61 | 3 |
| | 62 | 3 |
| | 60 | 1 |
| | 65 | 1 |
| Philadelphia | 176 | 4 |

0 20 40 60 80 100 120

## % Payment Discrepancy by City



# OPERATIONS TEAM DASHBOARD

## Payment Discrepancy Indicator

**9.63%**

% of all Orders in Order_Fulfillment table with mismatching In_Store_Payment_Amount and POS_Transactions.Total_Amount

## Payment Discrepancies

**104**

Total # of Orders in Order_Fulfillment table with mismatching In_Store_Payment_Amount and POS_Transactions.Total_Amount

## Select Metric

Null Order_Id

Payment Discrepancy

## Null Order_Id Indicator

**2.48%**

% of all Transactions in POS_Transactions table with missing Order_id

## Null Order_id's

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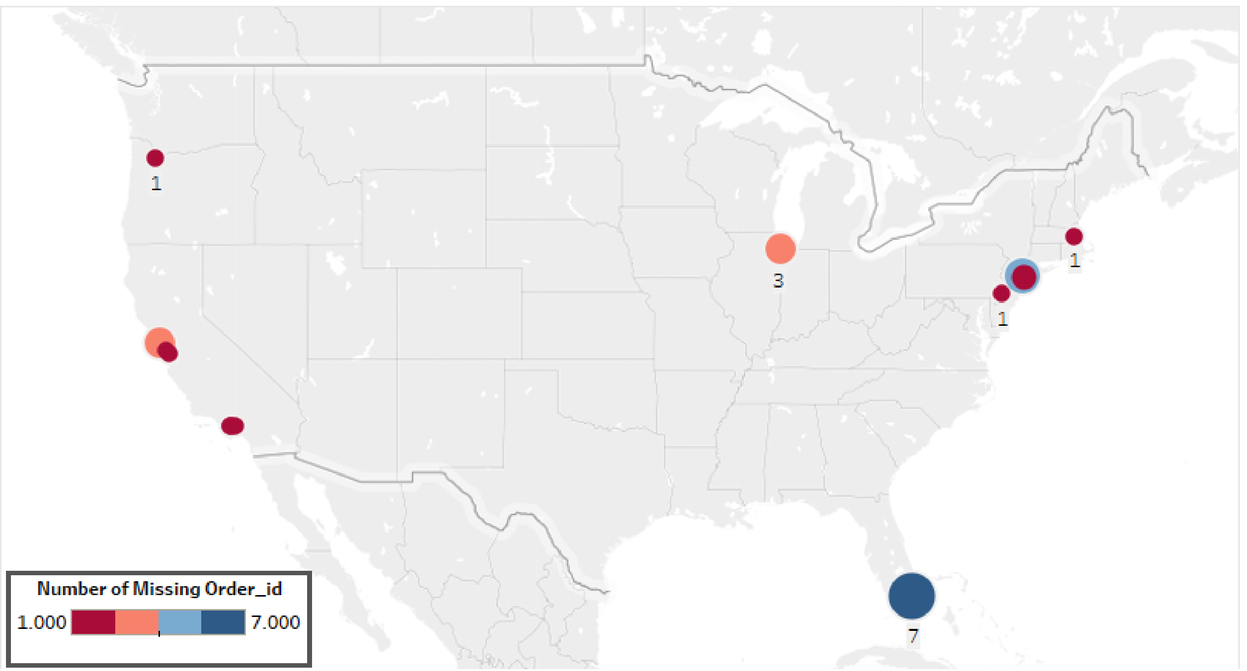
Total Number of Transactions in POS_Transactions table with missing Order_id

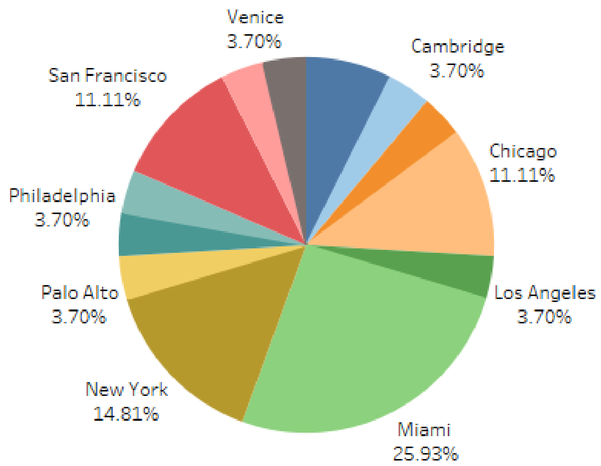
## Geographic Map of Stores with Missing Order_id




## # of Null Order_id's

| City | Store Id | |
|---|---|---|
| Grand Total | | 27 |
| Brooklyn | 523 | 2 |
| Cambridge | 158 | 1 |
| Campbell | 260 | 1 |
| Chicago | 101 | 2 |
| | 102 | 1 |
| Los Angeles | 373 | 1 |
| Miami | 1076 | 3 |
| | 1075 | 2 |
| | 1077 | 2 |
| New York | 520 | 2 |
| | 212 | 1 |
| | 521 | 1 |
| Palo Alto | 71 | 1 |
| Philadelphia | 175 | 1 |
| Portland | 598 | 1 |
| San Francisco | 61 | 1 |
| | 62 | 1 |
| | 145 | 1 |
| Santa Monica | 242 | 1 |
| Venice | 241 | 1 |

## % Null Order_id's by City



# FINANCE TEAM DASHBOARD

## Payment Discrepancy Indicator

9.63%

% of all Orders in Order_Fulfillment table with mismatching In_Store_Payment_Amount and POS_Transactions.Total_Amount

## Payment Discrepancies

104

Total # of Orders in Order_Fulfillment table with mismatching In_Store_Payment_Amount and POS_Transactions.Total_Amount

## Select Months

July August September

## Null Order_Id Indicator

2.48%

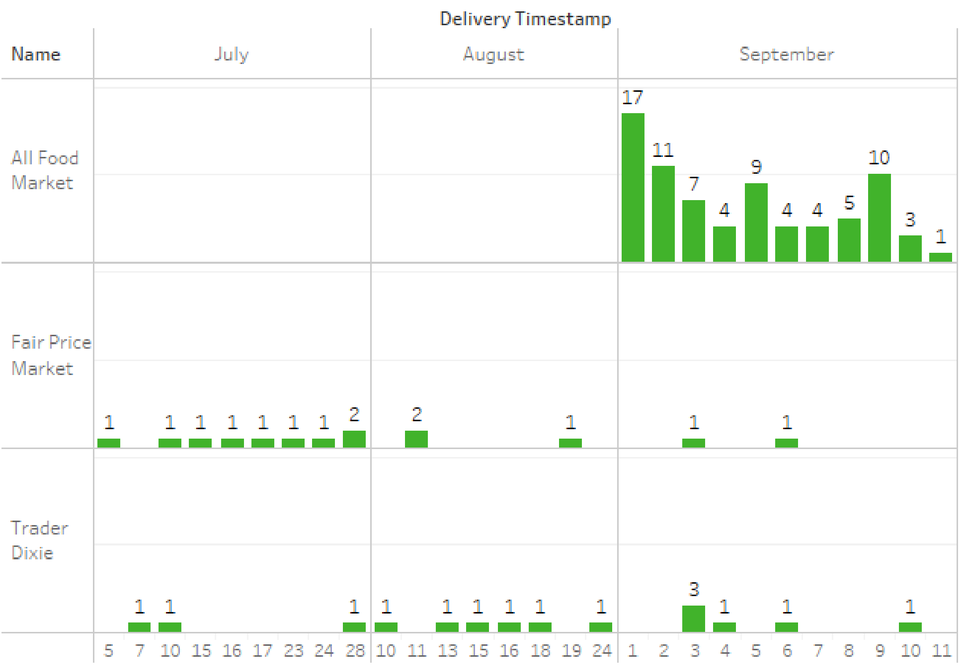
% of all Transactions in POS_Transactions table with missing Order_id

## Null Order_id's

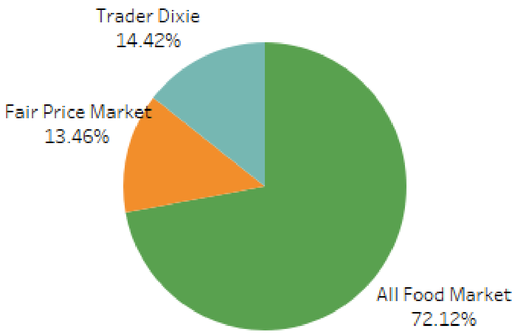
27

Total Number of Transactions in POS_Transactions table with missing Order_id

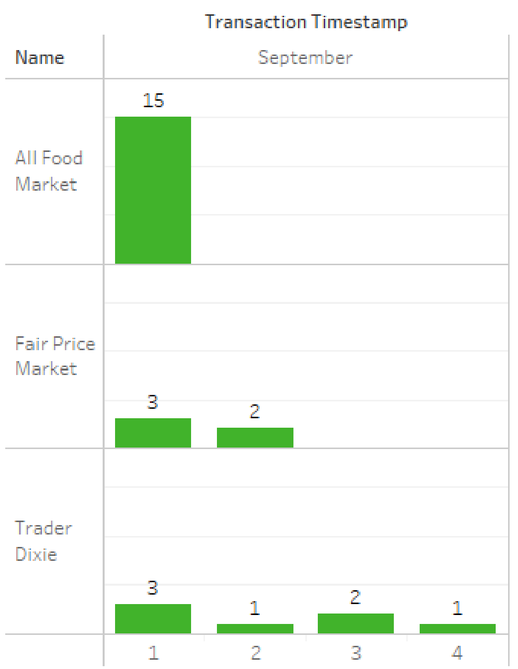
## Payment Amount Discrepancies by Date



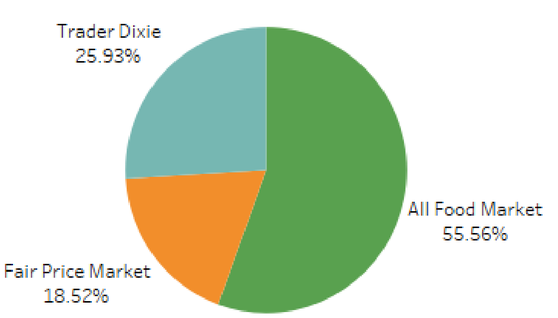

## Percentage of Payment Amount Discrepancies by Retailer




## Missing Order_id's by Date




## Percentage of Missing Order_id's by Retailer

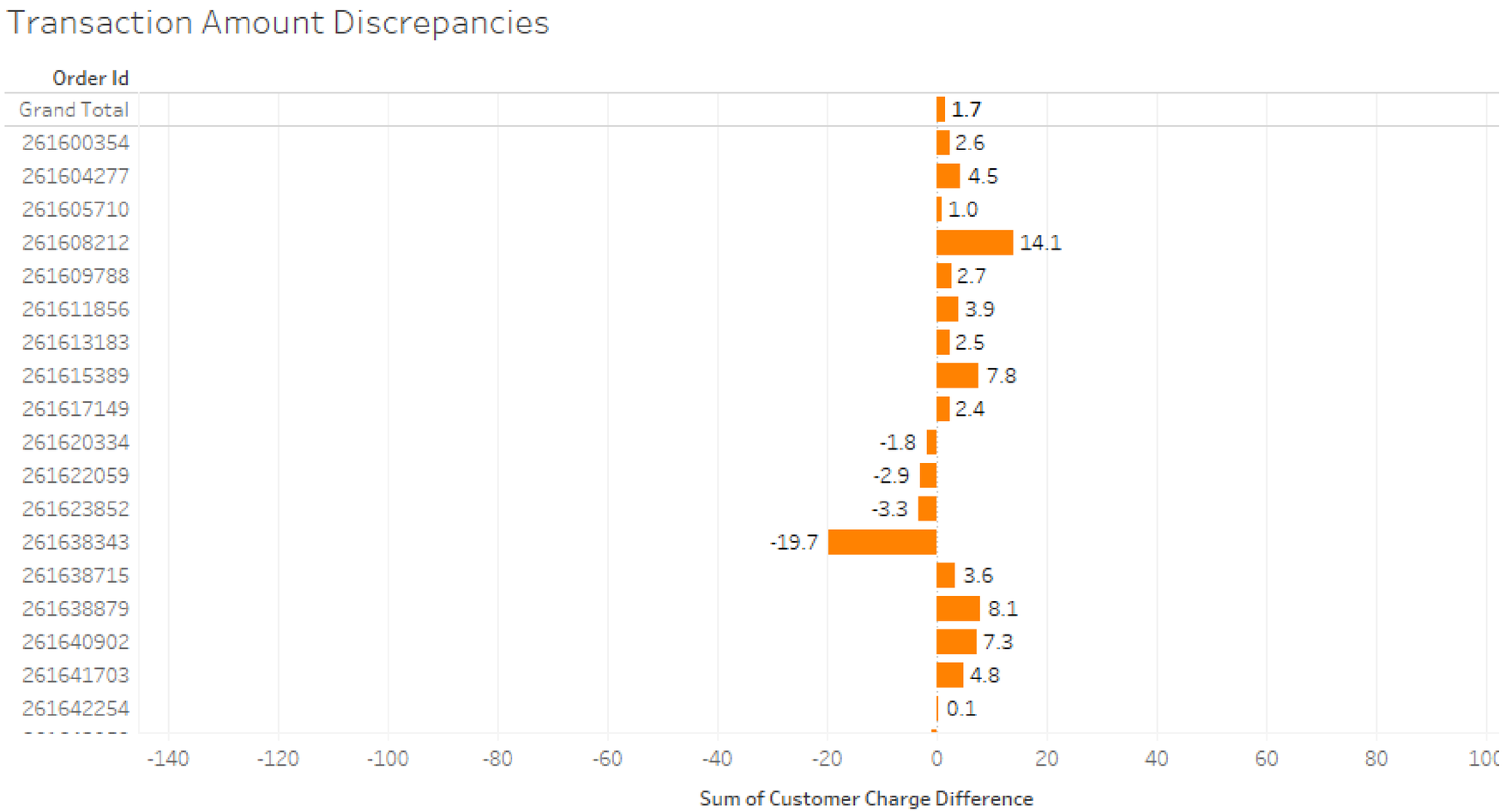


# Figures and Charts

| Change in Population, Census Bureau Estimates April 2010 to July 2016 | | | | |
|---|---|---|---|---|
| | | | Change: Census 2010 and Estimates 2016 | |
| | Census 2010 | Estimates 2016 | Number | Percent |
| **New York State** | 19,378,102 | 19,745,289 | 367,187 | 1.9 |
| **New York City** | **8,175,133** | **8,537,673** | **362,540** | **4.4** |
| **Bronx** | 1,385,108 | 1,455,720 | 70,612 | 5.1 |
| **Brooklyn** | 2,504,700 | 2,629,150 | 124,450 | 5.0 |
| **Manhattan** | 1,585,873 | 1,643,734 | 57,861 | 3.6 |
| **Queens** | 2,230,722 | 2,333,054 | 102,332 | 4.6 |
| **Staten Island** | 468,730 | 476,015 | 7,285 | 1.6 |
| *NYC as % of NYS* | *42.2* | *43.2* | *98.7* | |

Source: 2010 Census; Census Bureau Current Estimates Program

# Figures and Charts




**After taking the difference between Customer Charge Amount and In Store Payment Amount it was found that the business came out at about even with all charge discrepancies.**