Note: Please zoom in to see numbers in visuals. Thank you!

Introduction

Problem: Due to the higher-than-normal cost and time it takes to onboard locally-owned stores, it is essential that these stores can flourish once on the food delivery app, through customer acquisition and retention.

Challenges: Because of its complexity, onboarding locally-owned stores is challenging. Trying to automate catalog marketing for these stores is not an easy feat because methods of tracking inventory are inconsistent among locally owned stores.

Solution: I focused on the pick-up driver and merchant relationship to determine how this affects customers through Cohort Analysis. I discovered that the pick-up driver retention rate heavily relies on the availability of deliveries. Based on my core analysis, I recommend increasing customers' bond to locally-owned stores, forming exclusive relationships with well-known local merchants, and encouraging loyalty between the food delivery app and pick-up drivers.

Cleaning The Data

Cleaning techniques used:

1. Separating columns with timestamps to their own date and time column.
2. Converted all columns to appropriate datatypes.
    a. Including columns with True/False or 0/1 converting to boolean.
3. Converted the time zone from UTC to EST because Columbus, OH is in EST, and the time columns are in UTC.
4. Converted columns in minutes to Hours, Minutes, and Seconds (H:M:S).
5. Created a first day of the week column, given a delivery's timestamp

After looking at the distributions of numerical variables, I was alarmed at DELIV_D2R. A couple of values were on the higher end, whereas most were on the lower end. This could throw off any aggregations on that column, such as an average. However, I decided to keep these deliveries and keep this in mind when performing any aggregations.

Assumptions

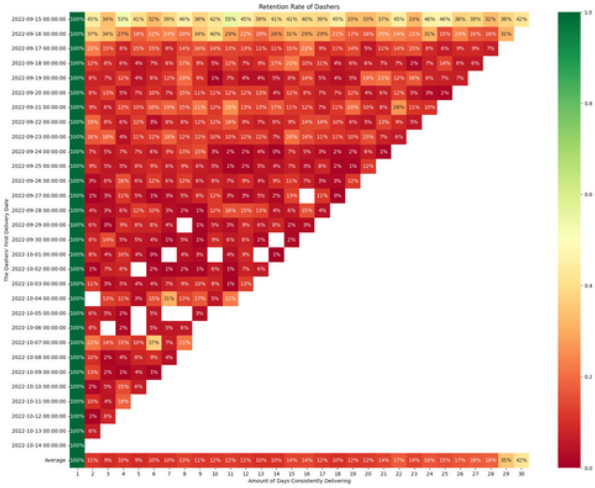
- 9/15/2022 was the earliest date any pick-up driver could have been assigned a delivery.
- No outside factors, such as holidays or major traffic events in Columbus, OH, would have affected pick-up driver's ability to complete deliveries.
- Every delivery only uses one pick-up driver.
- "ITEM_PRICE_CENTS" in the dataset glossary is actually "ITEM_PRICE" in the dataset and is not in cents.
- Revenue was calculated as (avg. delivery cost x amount of unique delivery ids).
- Customers only had a choice of 4 stores.
- This dataset is a sample of non-restaurant ordering customers on the food delivery app.

Analysis

KPIs (Key Performance Indicators)

For our KPI, I chose to measure the daily pick-up driver retention rate. Since pick-up drivers are gig workers, I wanted to focus on their daily activities.
For retention rate, I used the equation: [(Number of pick-up drivers At the End of the Day - Number of New pick-up drivers During the Day) / Number of pick-up drivers At The Beginning of the Day] x 100.

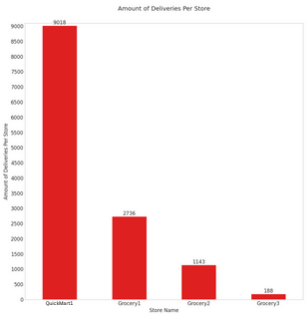
Analysis



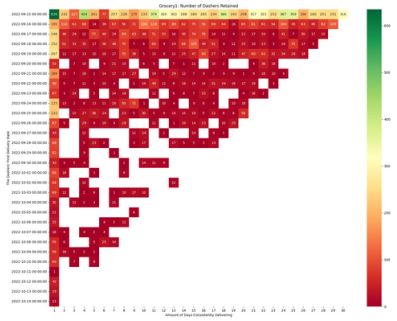
Our heatmap demonstrates that pick-up drivers who made their first delivery on 9/15/22 and 9/16/22 had the highest retention rates. 45% of pick-up drivers who first delivered on 9/15/22 returned the following day. While pick-up drivers, who made their first delivery on 9/27/22, 10/2/22, 10/10/22, and 10/12/22, had one of the worst retention rates. Only 1% of pick-up drivers who made their first delivery on 9/27/22 returned the following day. Overall, pick-up drivers do not have high retention rates. This means that new pick-up drivers are leaving the food delivery app app fairly quickly. After confirming that there were no outside factors, such as holidays or major traffic events, we can use our dataset to obtain the root cause of low pick-up driver retention rates.

Root Cause Analysis

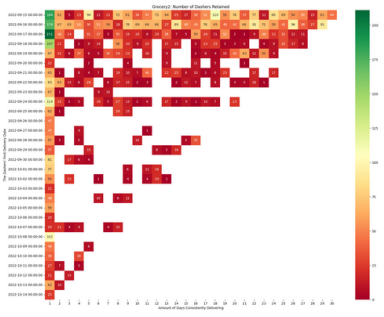
I decided to look at the trend of several factors, including merchants, number of orders, and revenue when the churn rate (percentage of pick-up drivers lost) was 99% the following day. Those dates were: 9/27, 10/12, and 10/20. Then, I will compare it to days when the retention rate was at least 20% the following day. These dates were: 9/15, 9/16, 9/17, and 10/7.



Let's look at the distribution of stores. Most deliveries are coming from QuickMart1 compared to all 3 grocery stores. The smallest number of deliveries is coming from Grocery3. This is helpful to know when looking at pick-up driver retention by the store because lower retention rates can mislead us when there is a small number of pick-up drivers. Therefore, I will use the raw numbers instead of the rate.

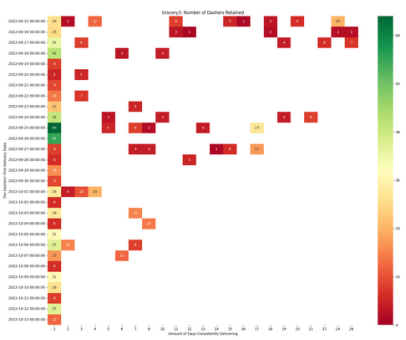


Grocery1

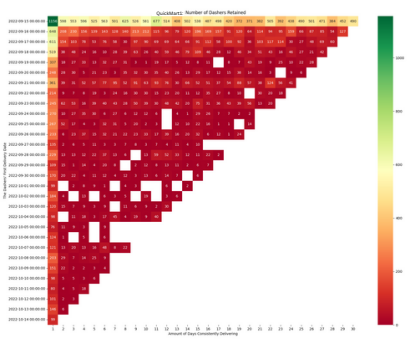


Grocery2

On days when our churn rate was 99% the following day, only Grocery1 and QuickMart1 retained any pick-up drivers. Grocery2 and Grocery3 did not have any pick-up drivers accept deliveries the next day. However, when our retention rate was at least 20% the following day, only Grocery1, Grocery2, and QuickMart1 retained pick-up drivers. Grocery3 still saw a high churn rate—each store's ability to have deliveries aligned with the number of pick-up drivers going to their store. QuickMart1 had the highest retention of pick-up drivers and had a significant number of pick-up drivers. This is compared to Grocery3, which had the lowest retention of pick-up drivers and the lowest amount of pick-up drivers. Let's do a deeper dive into the health of each store by looking at order count, average order value, and revenue.



Grocery3

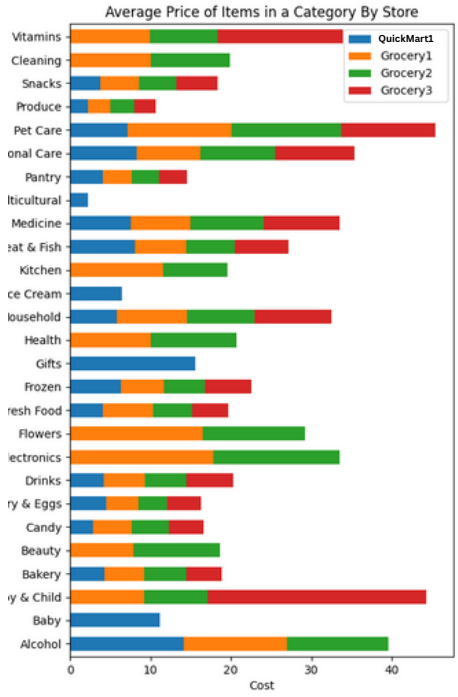


QuickMart1

Analysis

Store Name	Amount of Deliveries	Average Order Price	Revenue
QuickMart1	9,018	$18.24	$164,504.24
Grocery1	2,736	$33.40	$91,377.00
Grocery2	1,143	$34.16	$39,041.38
Grocery3	188	$32.63	$6,134.60

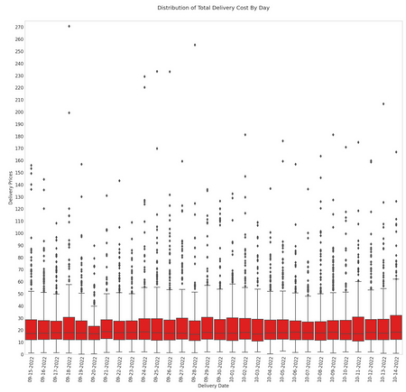
QuickMart1 has the most deliveries, the highest revenue, and the lowest average order amount. Despite Grocery2 having the highest average order amount, they do not have as many deliveries and thus have a smaller revenue than other stores. Shockingly, although having a higher price point, Grocery3 had a significantly lower revenue due to low deliveries. This demonstrates that customers may be following the cheapest option. Let's dive deeper into what customers buy from these stores to validate that customers may follow the cheapest option.



This visual highlights that Grocery3's lack of orders may be due to a lack of variety. When shopping, most customers chose Grocery1 and Grocery2 to fulfill most categories. For categories such as Kitchen or Flowers, customers exclusively shopped at Grocery2 and Grocery3. Price does not seem to be the largest determinant of where customers shop. Some further investigation would need to be done on the type of audience each store is targeting and the items each store offers. This can determine whether each store has a similar variety, but customers are loyal to certain stores. Or if these stores have a smaller variety of categories, so by default, customers choose other stores to satisfy their needs.

Revenue

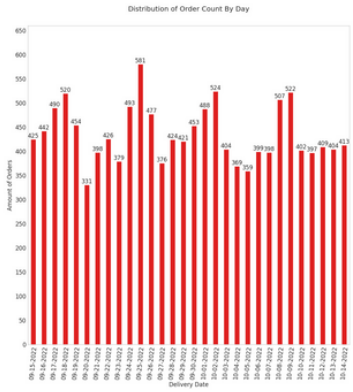
There were 13,084 deliveries with an average delivery cost amount of $23. The total revenue for this dataset was $301,057.22. Let's look at a boxplot of the total delivery cost by day.



As a general note, this visualizes that the middle 50% of all delivery order costs, which would mean most were between $10-$30. On the dates where the following day had a retention rate of at least 20%, there was little to no change in the middle 50% interquartile range. Most likely, pick-up drivers saw an equal opportunity to earn a similar amount to what they earned the day prior. However, it varied on the dates, with a churn rate of 1% the following day. On 9/28, the middle 50% decreased from 9/27, although there were outliers with higher delivery order costs. On 10/3, there was a notable drop in the lower quartile from 10/2. Meaning the lower range in which most delivery order costs fell into decreased. Lastly, on 10/13, there was little to no change in the middle 50%, but there were higher outliers. A decrease in delivery costs may affect whether pick-up drivers decide to stay on the app the next day; however, this is not the driving force.

By Number of Orders

There were large jumps in order amounts for dates, with a retention rate of at least 20% the following day. Whereas dates with a churn rate of 1% the following day typically saw a decrease, except for 9/27. Although, the decrease did not seem drastic. This could imply that pick-up drivers are more sensitive to the availability of orders on the app and place less importance on the order price. I compared a few more dates with large decreases in order count to verify this possibility. The following days 9/25 and 10/9, saw a retention rate of 9% and 13%, respectively.



Final Insights

Through measuring the daily retention rate for pick-up drivers, we were able to identify several factors that are hindering merchant revenue. We expect the pick-up driver retention rate to decrease when pick-up drivers are not assigned enough deliveries. Pick-up driver will choose another flexible food delivery app, for available deliveries. From a cycle perspective, fewer pick-up drivers can cause increased wait time for customers if delivery demand exceeds pick-up drivers, and unsatisfied customers will lead to fewer deliveries being placed, which will decrease store revenue for merchants on the food delivery app. Although each merchant acquired customers, not all could retain them.

Our analysis identified the differences in daily pick-up driver retention rates for each merchant. Pick-up drivers' preference for the food delivery app was further showcased through our daily average order price boxplot. Order cost did not significantly vary daily. There was little correlation between the pick-up driver retention rate and daily order cost. However, in our following histogram, the number of orders correlated with the pick-up driver retention rate. Following days where there was a drop in orders, pick-up driver churn rates increased. pick-up drivers valued the availability of orders rather than the price or their loyalty to the the food delivery app.

While Grocery1 and QuickMart1 retained pick-up drivers when the overall pick-up driver retention rate dropped during certain days, Grocery3 struggled to retain pick-up drivers even when the overall pick-up driver retention rate was high.

Grocery3's average order price was similar to Grocery1 and Grocery2, but their revenue was significantly lower. This is most likely due to the lack of orders rather than price. QuickMart1 further emphasized this because it had the most orders and the lowest average order price; however, QuickMart1 is not preferred for every item category by customers. Customers preferred to order from Grocery2 and Grocery3 for most categories. This could signify customer loyalty for merchants, or merchants may not offer items from all categories.

Recommendations

Recommendation 1

Use the low variety of items and categories locally owned businesses tend to have as a method to build up loyalty rather than hinder it. These are the following methods to implement:

1. Allow locally-owned businesses to list local events they will attend on their page on the app. This will allow local businesses and customers to build in-person and online relationships. For example, customers exclusively buy tequila from a local liquor store because they engaged in a make-your-own margarita class.
2. Have a feature for locally-owned businesses to showcase their specialized knowledge in the food delivery app via a mini blog/vlog.
3. On the app, when analyzing customers' past deliveries and searches to make recommendations, recommend local merchants instead of big-name merchants.
4. Allow locally-owned businesses to update their page on the app with location-specific news, such as showcasing a review from a popular local person or announcing new products that match the local theme. For example, the Florida Keys has an annual Underwater Music Festival. A local merchant can announce a new tropical rum they sell.
5. Encourage local merchants to post pictures and detailed descriptions of their products.

More delivery requests from customers to local businesses will lead to more deliveries being fulfilled by pick-up drivers. In my analysis, pick-up drivers stay on the app when there are many deliveries. More pick-up drivers translate to reduced wait time for customers. Also, since part of the pick-up driver's base pay is based on the distance they drive for the order, more pick-up drivers available in a particular area should mean less time/distance it takes to drive, so a lower base pay; pick-up drivers will be satisfied with the number of orders they can fulfill, and there will be more revenue for the food delivery app. This will help increase demand for locally owned merchants.

Recommendations

Recommendation 2

Pursue exclusive relationships with merchants that are well-known in the local area. These are the following methods to implement:

1. Have a personalized onboarding process. Although an automated onboarding process is essential for the food delivery app, given time and money constraints, there should be some investment in teaching new merchants how to take advantage of the food delivery app's platform—particularly emphasizing why the food delivery app is the best third-party delivery app for their business.
    a. Creating newsletters/articles for local merchant success will complement their experience.
2. Add features to the local merchant's page within the app addressing their marketing needs. This complements the first recommendation. Local merchants with fewer resources typically need more help addressing customer pain points.
3. Giving local merchants extra perks for positive performance. Since local merchants will likely have a smaller revenue than large brands, it is essential to recognize their milestones, such as the first 100 orders.
4. Offering a referral perk

The goal is to acquire more customers for the food delivery app that will eventually spend their money on other stores, although they may start their food delivery journey by ordering from a merchant they are loyal to. In my analysis, customers value brand loyalty more than they do prices. Retaining customers acquired through their pre-existing relationships with other merchants will lead to more deliveries for pick-up drivers to make and more orders for merchants to fulfill. Additionally, word of mouth is an extremely helpful marketing technique within local businesses. Newer local businesses may be encouraged to join the food delivery app as a merchant if more established businesses in the area have an enjoyable and profitable experience.

Recommendation 3

Incite loyalty among pick-up drivers in ways other than the perks the food delivery app offers.

1. Work with local merchants to provide milestone incentives to pick-up drivers with great performance in the area. This will also help pick-up drivers feel more integrated into the three-sided market.
2. Invite feedback from pick-up drivers on their experience with both merchants and customers. This will help pick-up drivers feel more connected to the food delivery app's culture and give more insight into how local merchants are becoming acclimated with the app.
3. Offering a referral bonus for pick-up drivers who recommend a local merchant that signs up and sells on the the food delivery app.

This is crucial to maintain customer happiness when there may be a slow period (such as increased merchant times to complete orders or decreased customer orders). A slow period for most merchants, while only a few others have orders, can cause pick-up drivers to leave the app. Local merchants may have to choose between apps due to financial constraints. A lack of pick-up drivers to fulfill orders will be hard for local merchants to use only one third-party delivery app. As stated on the food delivery app's website, pick-up drivers value the flexibility and accessible earnings from the aapp. pick-up drivers considered themselves to be entrepreneurs instead of gig workers. Therefore, these features have to be emphasized when standing out from competitors.

Further Investigation

- Investigate how the pick-up driver's tips are affected by my variables.
- We can also examine the funnel that customers go through. For example, if orders are down, we can first examine how many visitors we had, how many added a product to the basket, how many proceeded to the checkout page, and finally, how many have confirmed their delivery.
- Deeper dive into pick-up driver retention rater at more than just the following day
- Calculate the customer retention rate
- Calculate the local merchant retention rate