Data Product Manager Nanodegree

Applying Data Science to Product Management

Final Project: Developing an MVP Launch Strategy for a Flying Taxi Service

Welcome to your first week at Flyber


Aybar

In this project, you will apply the skills acquired in this course to create the MVP launch strategy for the first flying car taxi service, Flyber, in one of the most congested cities in America -- New York City.

You are responsible for bringing the first flying car taxi service to market by analyzing data and building a product proposal.

You will need to use the SQL workspace provided in the Classroom, and Tableau Public, in order to successfully complete the project.

You'll present your answers, findings, and insights in the Answer Slides found in this deck. Feel free to include any additional slides, if needed.

Section 1: Data Exploration

Back to the basics of product management, identify your customer and their pain points:

- What are taxis used for?
- What are the characteristics of the users that leverage them?
- What are existing pain points with taxis?
- What are the existing pain points with digital ride-sharing services?

Answer Slide

- What are taxis used for?
  - Easy, Faster and Reliable commutation.
- What are the characteristics of the users that leverage them?
  - User segment: Business class, Working Class, Disabled, Pregnant/Children, Drunk, Lazy, People with minimal public transport access, Travelers with luggages, No driver's licence
- What are existing pain points with taxis?
  - Longer commute time in case of traffic.
  - Longer waiting time in the peak hrs.
  - Difficult to get taxis late night
- What are the existing pain points with digital ride-sharing services?
  - Surge pricing
  - Driver request cancellations in peak hrs.

What user improvements do you hypothesize a flying taxi service would have over the existing state of taxis today?

What market improvements do you hypothesize a flying taxi service would have the existing taxi service industry & physical road infrastructure today?

Answer Slide

What user improvements do you hypothesize a flying taxi service would have over the existing state of taxis today?

- Frictionless rides(Faster)
- Passengers will get an aerial view of the city.
- No road traffic signals.

What market improvements do you hypothesize a flying taxi service would have the existing taxi service industry & physical road infrastructure today?

- Main user segment will be users who is taking longer time in the taxi due to the heavy traffic in the peak hrs.
- Users those who are late to the airport/train/important meeting will be taking the airtaxi
- Next user segment will be users who are excited to see the aerial view of the city.
- There should be a bigger parking place for the air taxis
- In the beginning, The pickup and drop of will be in some peak locations in the city.
- If the pickup and drop off locations are near to a crowded place or a public place, there should be some measures to control the traffic or crowd to avoid accidents during the landing and takeoff.

Upload this dataset into Tableau Online.

Ensure the fields are parsed correctly; field headers are included in the first row of the CSV.

Let’s begin exploration!

Acquire a high-level understanding of the granularity and scope of the dataset, to inform the basis for your analyses:

- How many records are in the dataset
- What does each record represent?
- What is the primary key?
- What date range is your dataset bound to?
- What are the geographical bounds of this dataset? Is it limited to Manhattan, or is Brooklyn, Queens, Staten Island, the Bronx, and New Jersey included? Where are most of the data points centralized at? Are there outliers?

Answer Slide

- How many records are in the dataset?
  - 1048468
- What does each record represent?
  - Details of taxi rides in NY city from Jan - July 2016
- What is the primary key?
  - ID
- What date range is your dataset bound to?
  - Jan 2016 - July 2016
- What are the geographical bounds of this dataset? Is it limited to Manhattan, or is Brooklyn, Queens, Staten Island, the Bronx, and New Jersey included? Where are most of the data points centralized at? Are there outliers?
  - Most of the points are centralized at Manhattan, also low density extension to Queens, Brooklyn, Bronz
  - Outliers: JFK, LGA airport, Marine Air Terminal

You notice that the dataset does not contain explicit data points out-of the-box, we'll need to enrich the dataset with relevant fields:

- You notice that ride price is not included, but figure it could be derived. Based on information about New York taxi prices gleaned from the internet, create a calculated field called `price` using the `duration`, `distance`, and `passenger count` fields.
- You hypothesize your target users will be those who take a relatively longer time getting to a destination that is relatively close, due to heavy traffic conditions and/or limitations to physical road infrastructure. To be able to analyze where this is happening, you will need to create a calculated field called `distance-to-duration ratio`.

Let’s understand the scope and distribution various dimensions within the dataset. Calculate the **average**, **median**, and the **first & second standard deviation of the mean** for the following measures:

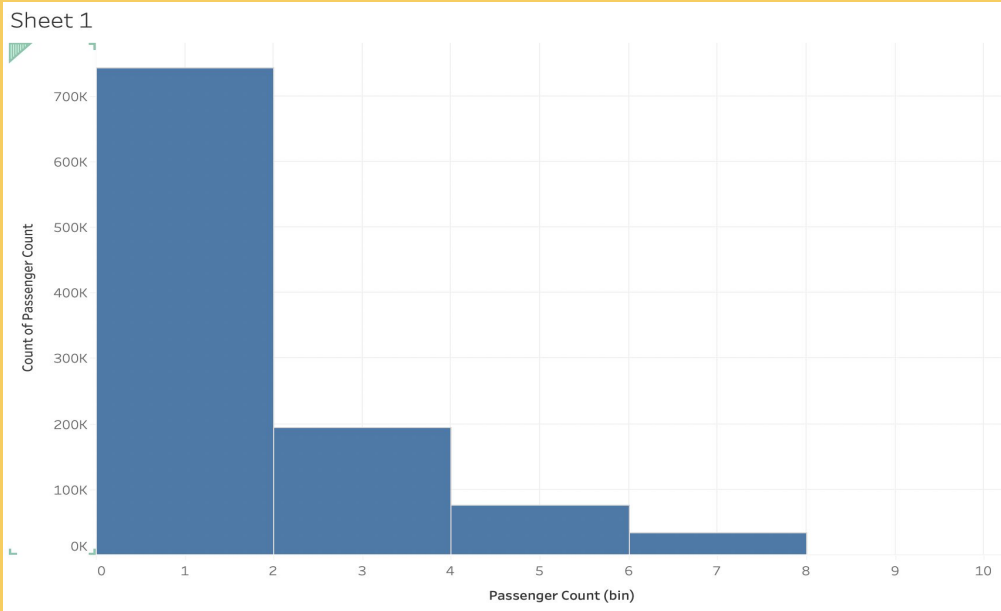
- Duration
- Distance
- passenger counts
- distance-to-duration ratio
- price

Answer Slide

	Mean	Median	SD1	SD2
Distance	3.442	2.095	7.824	12.206
Duration	962.2	662	6815.2	12668.2
Passenger count	1.664	1.000	2.978	4.292
dist:durat	.004009	.003554	.007563	.011117
Price	7.87	5.76	14.706	21.542

Flying cars may have to have to be a lower weight for efficiency & take-off. Or you may just decide to leverage mini-copters for your initial MVP.

Create a histogram that visualizes the number of total rides grouped by passenger counts to analyze the potential market volume of low passenger pickups (1-2 passengers).

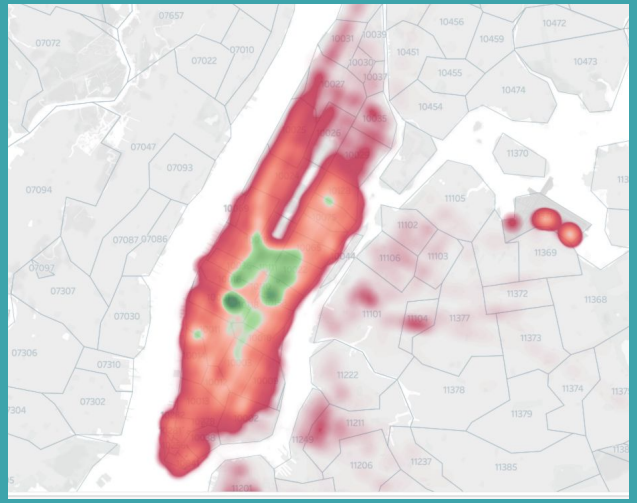


For the initial MVP launch (& most likely GA), we have a finite amount of monetary resources to build Flyber pick-up / drop-off nodes. We'll need to be strategic on where we'll place them:

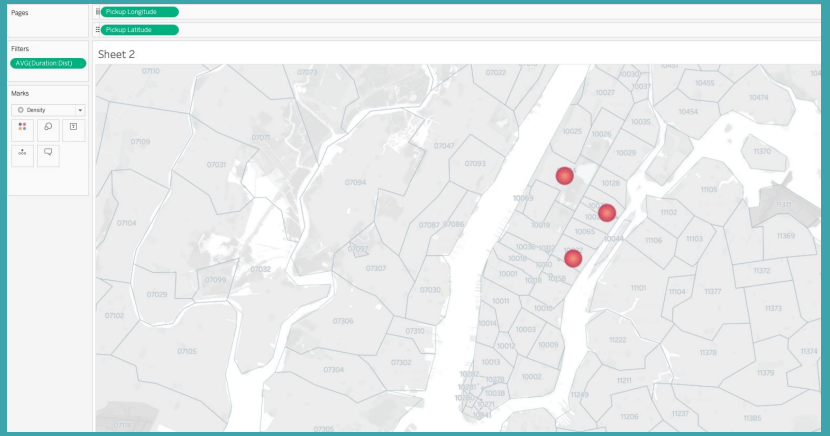
- Which neighborhoods/zip codes tends to experience a relatively higher density of pick-ups? 10001, 10058, 10036,10078
- Which neighborhoods/zip codes tends to experience a relatively higher density of drop-offs? 10001, 10018, 10178, 10036,10075
- Which neighborhoods/zip codes tends to have the highest duration-to-distance ratios, based on pick-up?10001,10078, 10018
- Which neighborhoods/zip codes tends to have the highest duration-to-distance ratios, based on drop-off?10019
- For any of the neighborhoods identified, are there any potential areas within the neighborhood that are optimal for flying taxi pick-up / drop-off? What makes them suitable?10001 and 10078

Answer Slide

- Which neighborhoods/zip codes tends to experience a relatively higher density of pick-ups?
  - 10001, 10058, 10036,10078

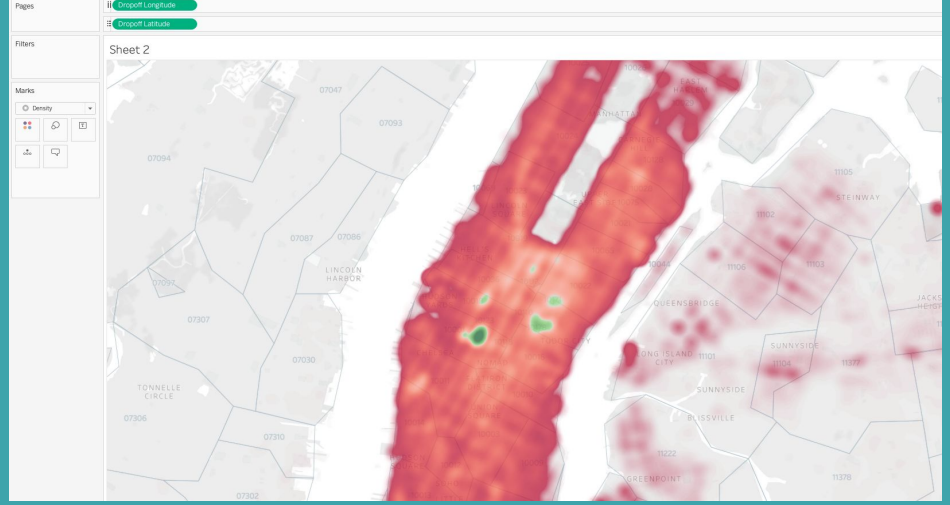


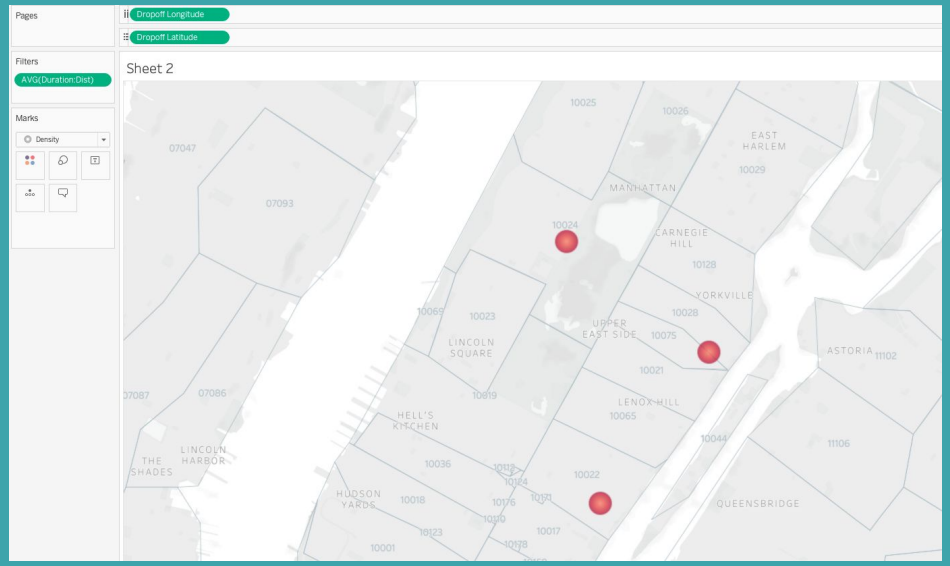
- Which neighborhoods/zip codes tends to have the highest duration-to-distance ratios, based on pick-up?
  - 10024,10022, 10075



Answer Slide

- Which neighborhoods/zip codes tends to experience a relatively higher density of drop-offs?
  - 10001, 10018, 10178, 10171
- Which neighborhoods/zip codes tends to have the highest duration-to-distance ratios, based on drop-off?
  - 10019
- For any of the neighborhoods identified, are there any potential areas within the neighborhood that are optimal for flying taxi pick-up / drop-off? What makes them suitable?
  - 10001 and 10078, This two postcode have the highest rate of pickups and dropoffs, so we can do our pilot run connecting this two areas.





It may not make operational sense to have the service running 24/7, for now.

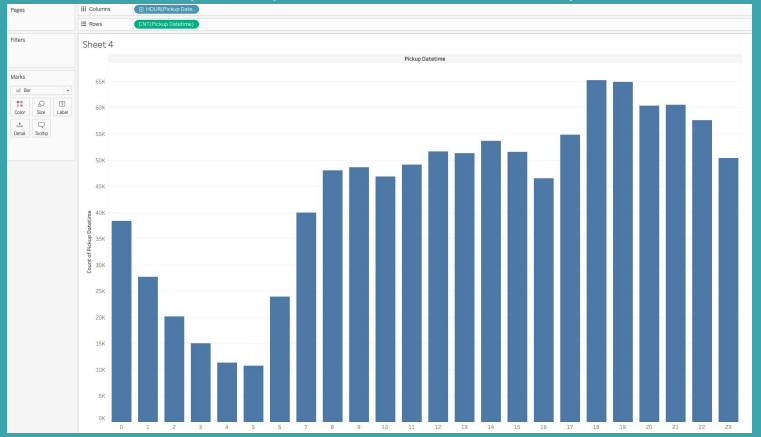
- What times throughout the day experience relatively higher volumes of ride pick-ups?
- What days throughout the week experience relatively higher volumes of ride pick-ups?
- Pinpoint any periods throughout the year that experience trend fluctuation or seasonality around ride pick-up volumes. This will help us in our post-launch analyses to determine if any spikes or dips were influenced by seasonality or through actual feature adoption/regression.

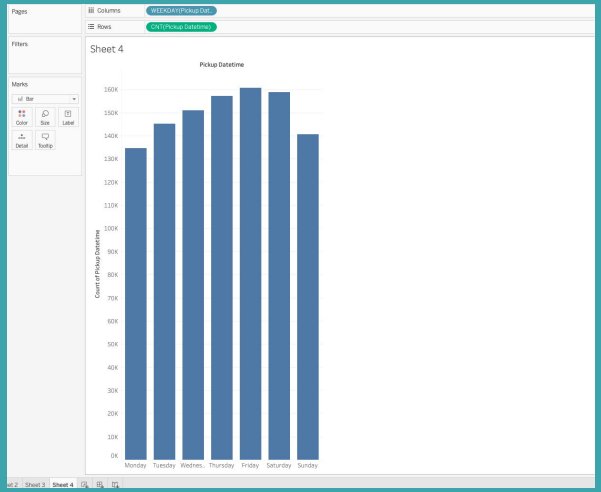
Answer Slide

- What times throughout the day experience relatively higher volumes of ride pick-ups?
  - 18,19,20,21,22 hrs

- What days throughout the week experience relatively higher volumes of ride pick-ups?
  - Thu, Fri, Sat, Sun

Pickup by hrs in a day.

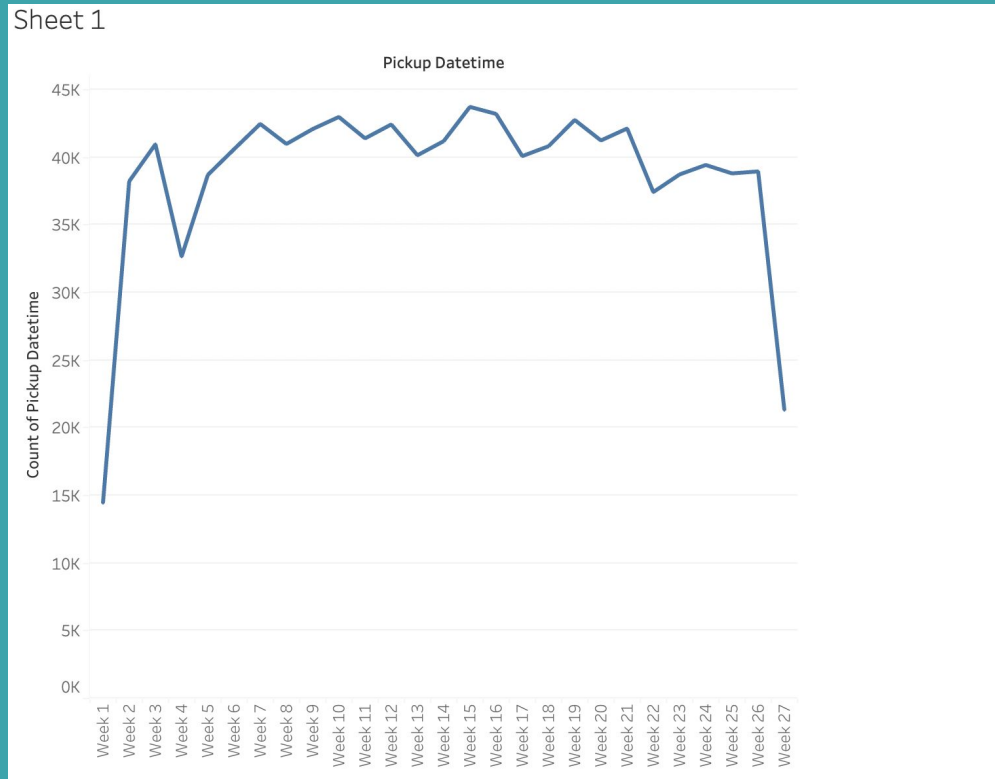




Answer Slide

- Pinpoint any periods throughout the year that experience trend fluctuation or seasonality around ride pick-up volumes. This will help us in our post-launch analyses to determine if any spikes or dips were influenced by seasonality or through actual feature adoption/regression.
    - Week 4 shows a drop from 40k to 32k. Then the ride pickups is in a stable state of around 40-50k/week. And the next droop is on week 22 and it is going down to 37k.

Pickup by week numbers.



You and the user research team ran a quantitative survey on existing taxi and/or rideshare users in New York City to determine sentiment around potentially using a flying taxi service.

Dive into the survey results dataset in order to extract insights from explicit feedback.

Upload this dataset into Tableau Online or a SQL database (the classroom contains a workspace with the data for you as well).

Ensure the fields are parsed correctly, field headers are included in the first row of the CSV.

Question schema:

Q1 - What is your email?
Q2 - What gender do you identify as?
Q3 - What is your age?
Q4 - What is your annual income? (income bands)
Q5 - What neighborhood do you reside in?
Q6 - Do you currently use taxis? (Y/N)
Q7 - Do you currently use ridesharing services? (Y/N)
Q8 - Would you use a flying taxi service, if such a concept existed? (Y/N)
Q9 - If yes to Q8, how much would you be willing to pay per mile for such a service? (USD)
Q10 - If no to Q8, what is the reason?

Calculations

Price -
(2.5 +(1.56 * [Distance] * 1.61)+([Duration]/3600) * 30)
Distance in Miles
Duration in Seconds

Duration to Distance Ratio -
IF([Distance] > 0.1 AND [Distance] < 1000) AND ([Duration]>=60 AND [Duration] <= 86065)
THEN [Duration]/([Distance]*60)
ELSE 0
END

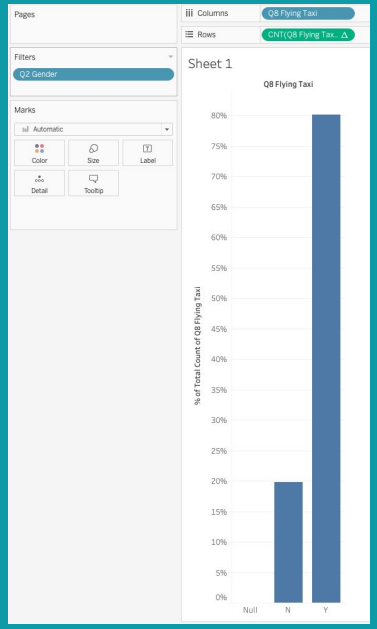
To inform our future product marketing efforts, we'll want to extract the following:

- Is there an inclination of better Flyber adoption based on gender, age, income level, or neighborhood of residence?
- What is the distribution of potential price per mile based on gender, age, income level, and neighborhood of residence?
- What is the different personas/segments of negative sentiment towards not using a flying taxi car service?

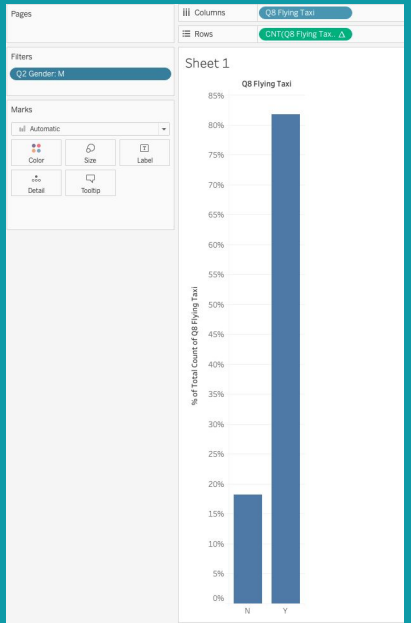
Answer Slide

- Is there an inclination of better Flyber adoption based on gender, age, income level, or neighborhood of residence?
- 80% are willing to take the flying taxi.
  - In M and F, 81% M and 79% F are willing to user the flying taxi service.

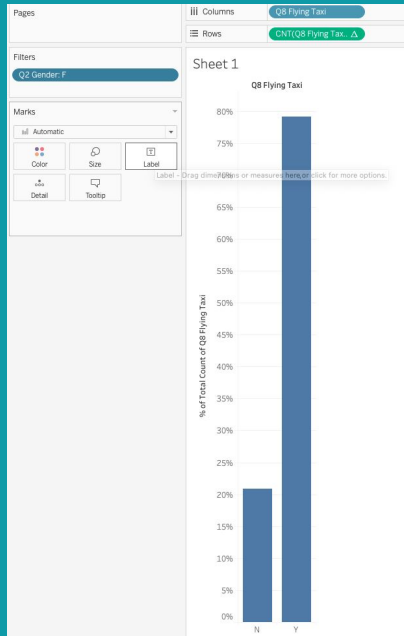
Total



Male

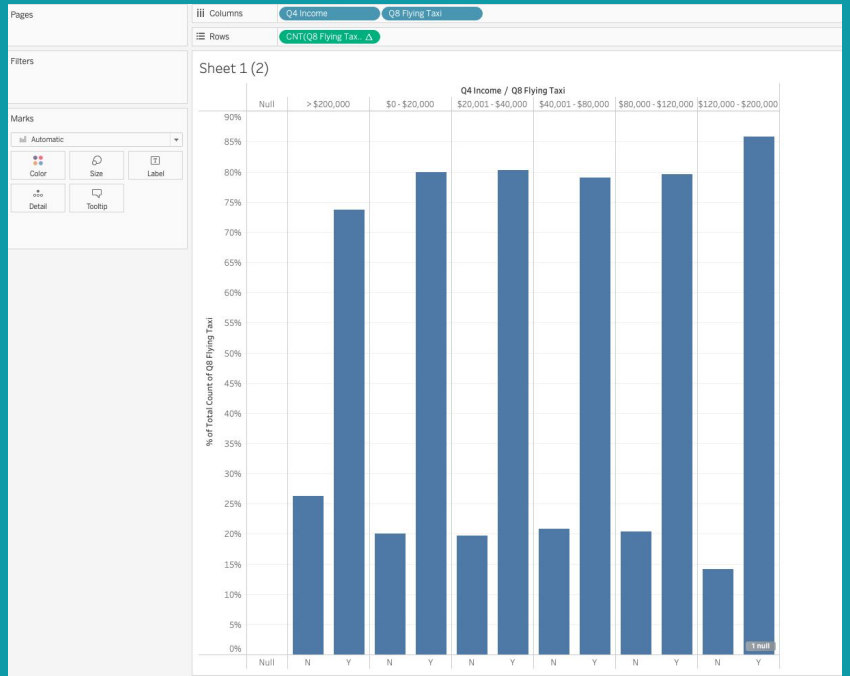


Female



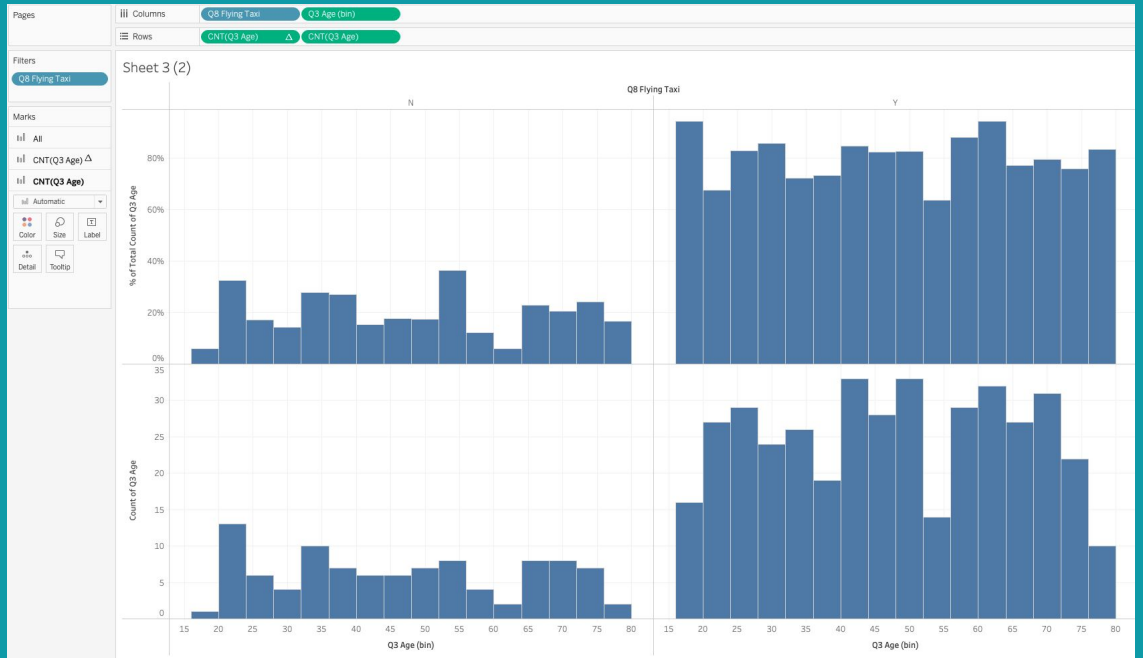
Answer Slide

- Is there an inclination of better Flyber adoption based on gender, age, income level, or neighborhood of residence?
  - Based on income: 120k to 200k group are the most possible group who will use flytaxi



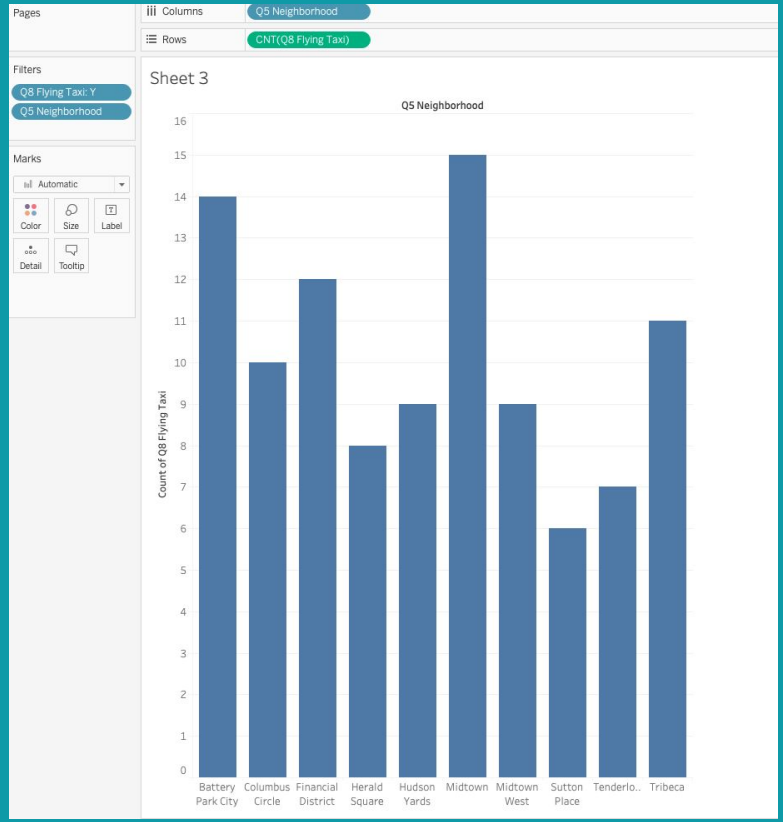
Answer Slide

- Is there an inclination of better Flyber adoption based on gender, age, income level, or neighborhood of residence?
  - We can focus on the age group from 40 - 50.
  -



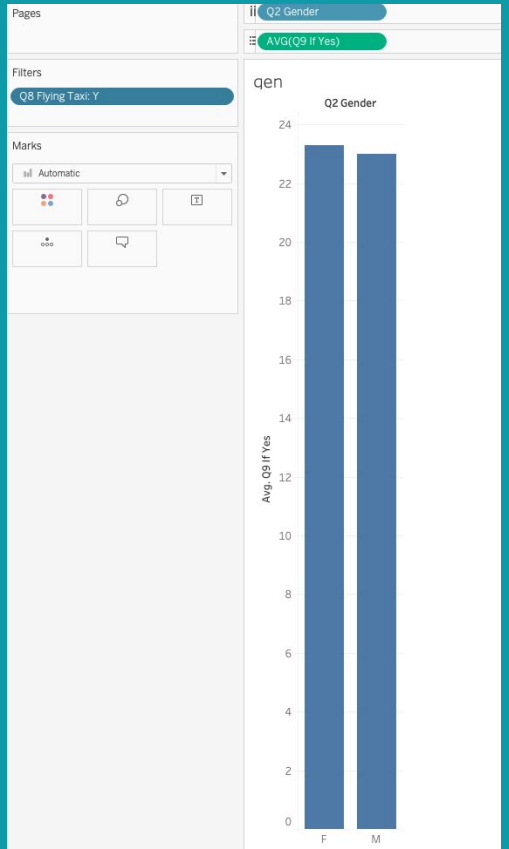
Answer Slide

- Is there an inclination of better Flyber adoption based on gender, age, income level, or neighborhood of residence?
    - Battery city park, columbus circle, Financial dist, Midtown and tribeca are the top 5 neighborhood which have the highest possibility.



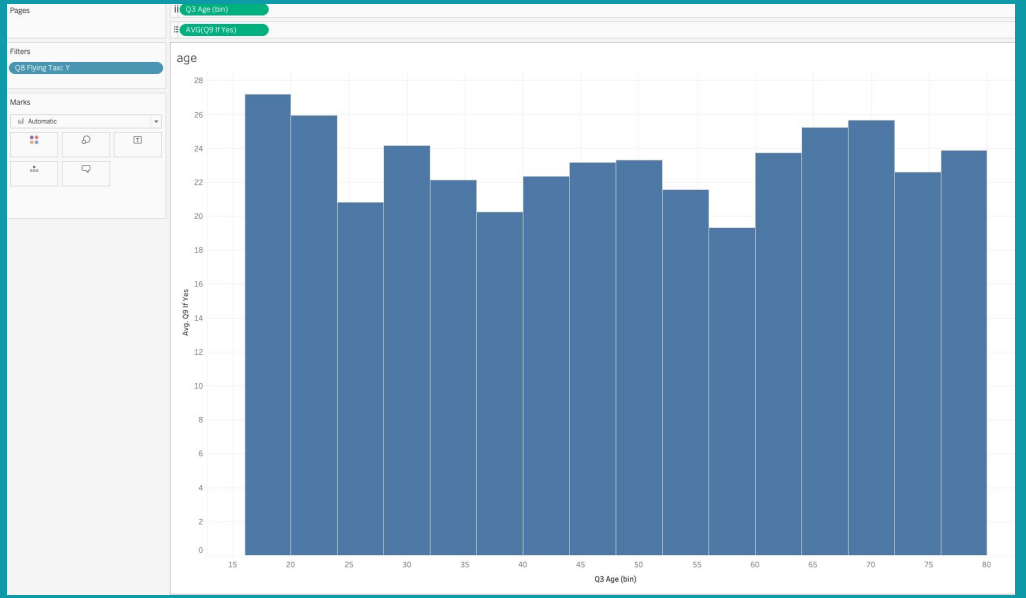
Answer Slide

- What is the distribution of potential price per mile based on gender, age, income level, and neighborhood of residence?
  - Based on gender, Both M and F are willing to pay 19.16 $ per mile.



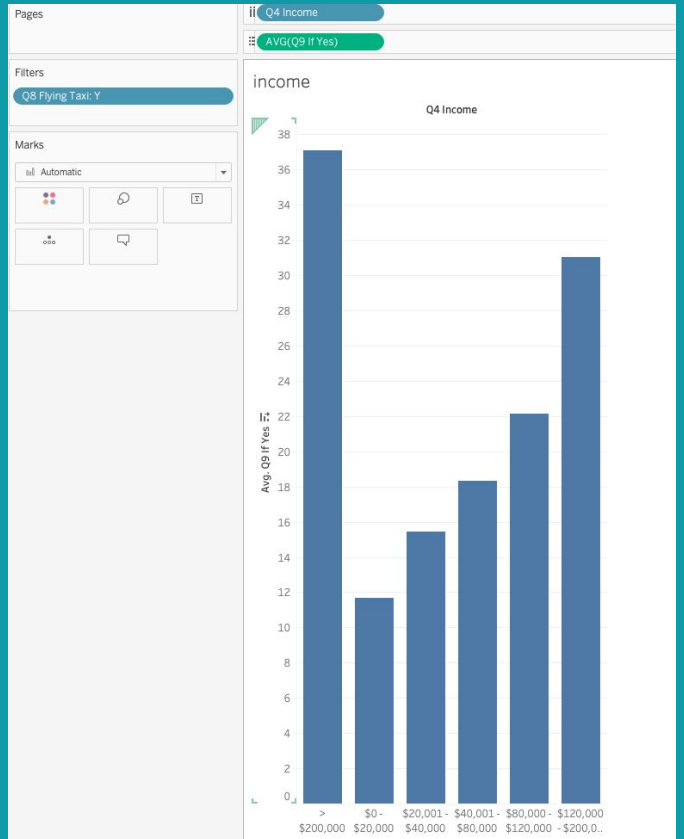
Answer Slide

- What is the distribution of potential price per mile based on gender, age, income level, and neighborhood of residence?
  - Avg price which users are willing to pay is 19.16 $ (age)
    - 16-23 and 64-71 are willing to pay above avg price.
    - 40-50 and 72-80 are willing to pay average and rest pays below avg.



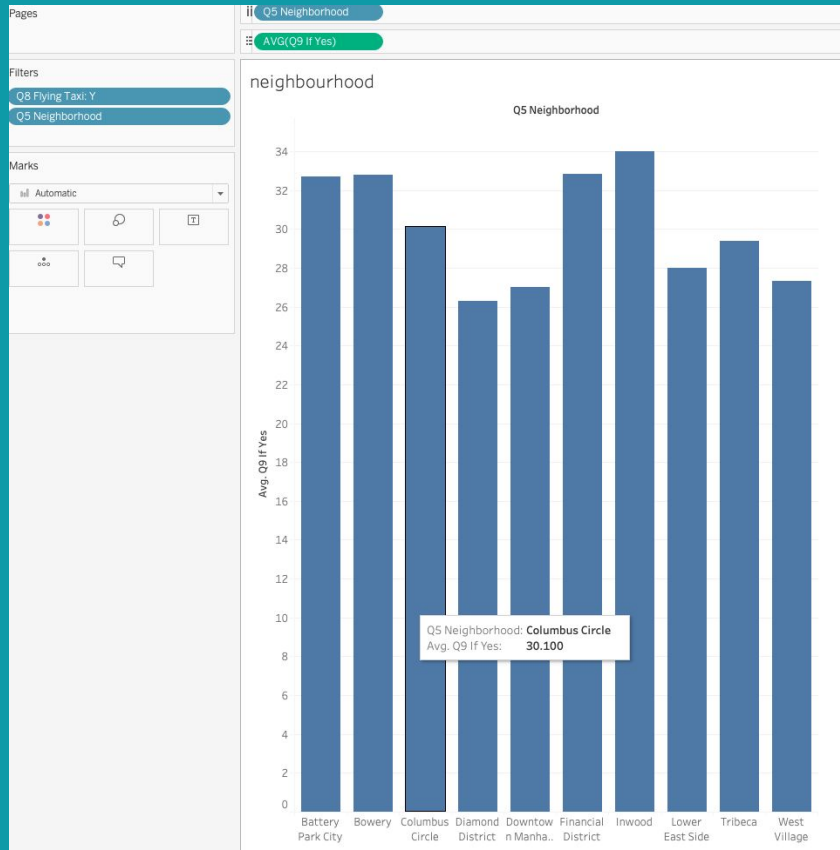
Answer Slide

- What is the distribution of potential price per mile based on gender, age, income level, and neighborhood of residence?
  - Avg price which users are willing to pay is 19.16 $ (INCOME)
    - Users with high income are willing to pay 19.16$ per mile



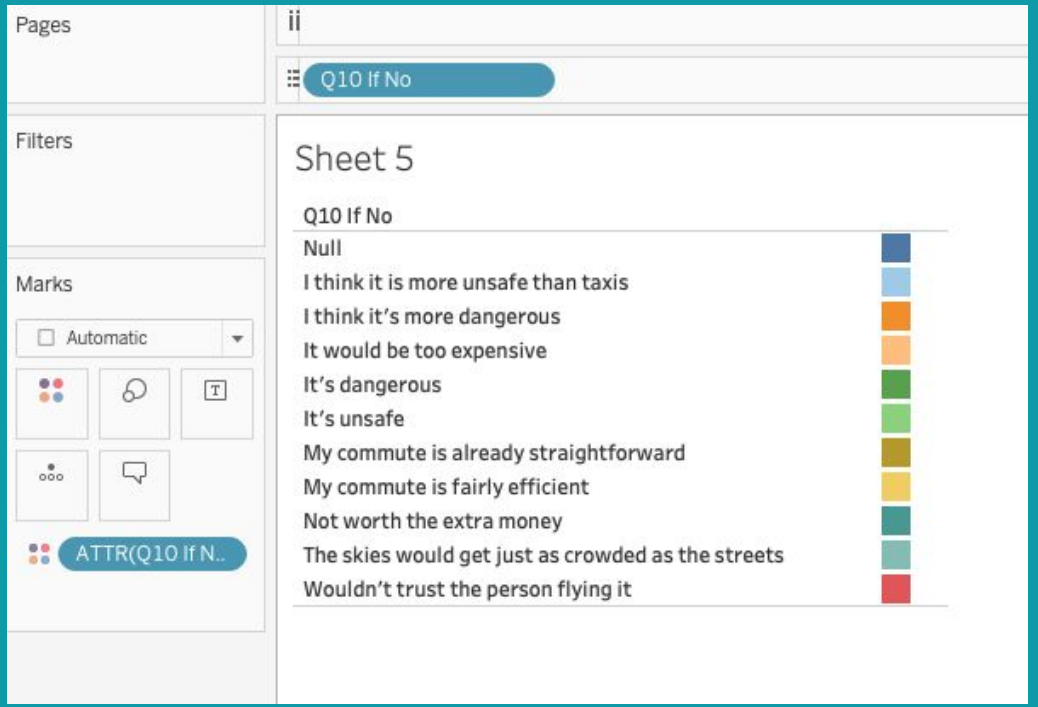
Answer Slide

- What is the different personas/segments of negative sentiment towards not using a flying taxi car service?
  - Top 10 neighbourhoods willing to pay 19.16 $/mile



Answer Slide

- What is the different personas/segments of negative sentiment towards not using a flying taxi car service?
  - Most of the users who said no, cause of the safety concerns.



Hooray! End of Section 1.

You will complete Section 2 at the end of this course.

Please submit this file for review for Section 1.

Section 2: Proposal Synthesis

Identify a product objective for Flyber's launch. Your product objective will guide your KPIs, so identify what Flyber should optimize for. Your objective should be centered around one the following focus areas:

- User Acquisition
- User Engagement
- User Retention
- Profitability

Explain your reasoning. Include both why you feel your focus area is more relevant than the others for Flyber at this time of the product development cycle.

Answer Slide

Product Objectives!

- User acquisition
  - Branding
    - It should involves developing a unique identity that can be used to differentiate the service from competitors. This identity should be supported by a strong brand story and messaging that resonates with potential customers. Additionally, the brand must be supported by a comprehensive digital strategy that includes an effective website, social media presence, and a strong online presence.
  - Marketing
    - A comprehensive digital marketing strategy should be implemented to reach potential customers. This should involve developing an effective website, optimizing content for search engines, and leveraging social media platforms. Additionally, it should involve creating engaging content to attract customers and launching targeted campaigns to target the right consumer segments
  - Customer service
    - Providing excellent customer service for the flying taxi service platform is essential for long-term success. This should involve proactively addressing customer issues, responding to inquiries and feedback in a timely manner, and providing helpful resources to customers. Additionally, a comprehensive customer service strategy should be developed to ensure that customers are provided with a smooth and positive experience. This should involve a well-trained customer service team that is available 24/7 and is knowledgeable about the service and its features.

- User experience
  - Designing a great UX for the flying taxi service platform is essential for providing an enjoyable and seamless experience for customers. This should involve conducting user research and testing to understand customers' needs, designing an intuitive and easy to use interface, and ensuring that the platform is accessible and usable on multiple devices.

Formulate 3-5 Key Performance Indicators (KPIs), to measure if the product is heading towards the right direction based on your objective

Answer Slide

- **Social media engagement,**
- **CTR - Website Traffic & App download,**
- **CAC,**
- **Conversion rate,**
- **Referral rate,**

Create hypotheses around what thresholds your KPIs would need to hit in order to determine success

Answer Slide

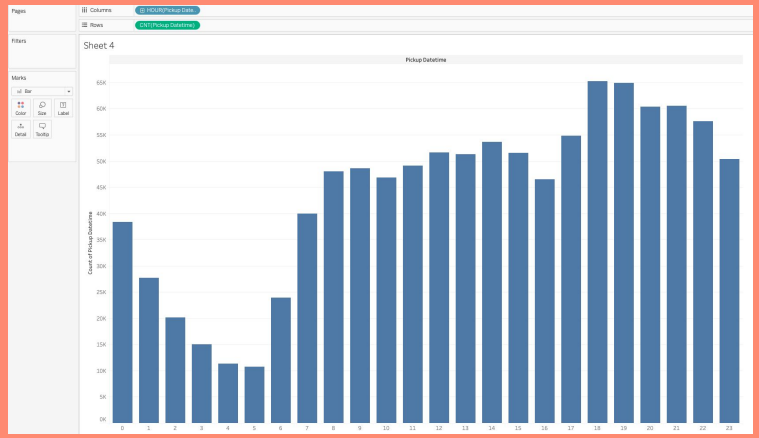
- Social media engagement
  - As it is an entirely new concept, the social media engagement will be high enough to generate traffic to the website and app download.
- CTR - Website traffic & App download
  - As a result of our offline and online marketing (social media), there will be 10-15% increase in our website traffic and app downloads in each week.
- Customer acquisition cost
  - In the first two quarters, the CAC will be higher (approx 100-200$/user). As the referral rate increases the CAC will reduce.
- Conversion rate
  - I assume the conversion rate for the flying taxi service will be much lower 2-7% in the first quarter because of the customer trust, safety and lease awareness.
- Referral rate
  - The referral rate will be much lower in the beginning, but there is high probability for the FTU (first time user) refer his/her friend to try this new concept. Si, I assume the referral rate will be slightly higher than the conversion rate in the first quarter.

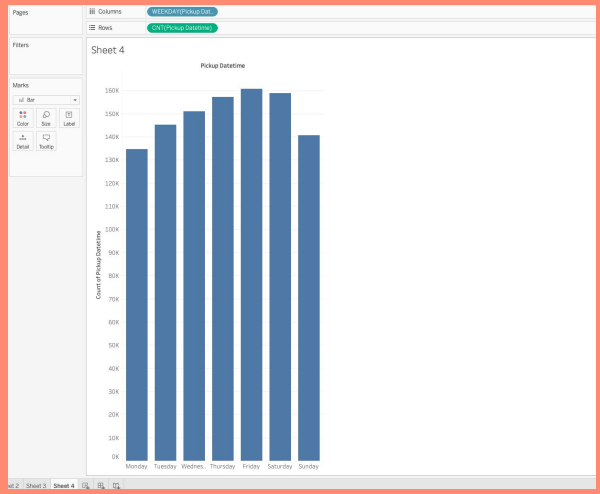
As the product manager, you make decisions based on the insights you extract, we'll need to know the feature set we'll include in the MVP to measure viability, while keeping operational expenditure under control:

- What times/days of operation should the service run for?
- How many pick-up / drop-off nodes should we have?
- Where should the nodes be located?
- Should we initially use copters or homegrown hardware?
- Should the pricing be fixed or dynamic? At what rates?

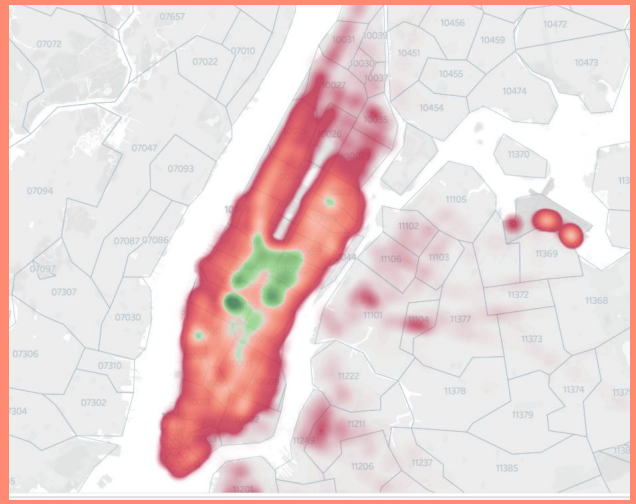
Answer Slide

- What times/days of operation should the service run for?
  - THU, FRI, SAT, SUN evening hrs are the peak time. 18,19,20 & 21 hrs.





- How many pick-up / drop-off nodes should we have?
- Where should the nodes be located?
    - There should be at least 4-5 pickup nodes in the following locations.
      10001, 10058, 10036,10078
- Should we initially use copters or homegrown hardware?
    - I think we should consider both homegrown h/w and copters. Homegrown h/w will give users a new experience.



Should the pricing be fixed or dynamic? At what rates?

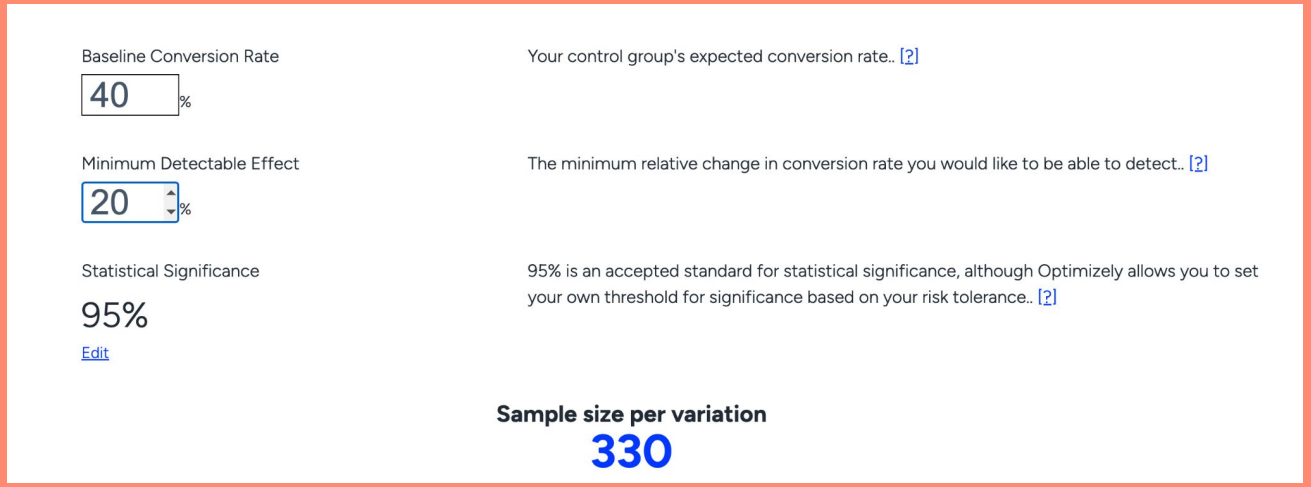
The pricing should be a fixed price at the starting. Over time, we will implement dynamic pricing

The base price calculation is given below:
PRICE: 2.5+ (1.5 * dist * 1.61) + ((duration/3600)*30)

Acc to the availability or demand the prices should increase dynamically from the given base rate at a later period. The dynamic pricing will happen after we acquire enough users to the platform.

Determine the MVP sample size & time period allotted estimated to come to a conclusion on your hypotheses.

Answer Slide



In this sample, The baseline conversion rate is 40% and the detectable effect is 20%., Then the sample size is 330. And the time period os the experiment will be 90 days.

Create an instrumentation plan for the events you need collected and logged, in order to be able to physically measure your KPIs.

Answer Slide

users visit the website
users download the apps
users uninstall the app
users sign up
users booking a trip
users completing the trip
users cancelling the trip
Avg amount spent by users
customer support tickets

Events

- User_id
- Pilot_id
- Pilot_profile_Created
- Pilot_profile_deleted
- User_profile_Created
- User_profile_deleted
- User_searched_location
- User_find_ride
- User_donot_find_ride
- Confirmed_ride
- Cancelled_ride
- Started_ride
- Completed_ride
- Payment_initilized
- Payment_done
- Payment_failed
- Customersupport_ticket_created
- Customersupport_ticket_closed

Create a qualitative feedback survey questions for users after their ride, to further understand and optimize the product for future iterations.

Answer Slide

- How did you hear about our flyber taxi service?
- How would you rate the overall experience of using our flyber taxi service?
- Were you satisfied with the safety measures taken during your flight?
- How was your experience with our customer service team before and after the flight?
- Was the booking process easy and straightforward?
- How would you rate the comfort of the flyber taxi during your ride?
- Pricing of the service was reasonable?
- How likely are you to recommend our flyber taxi service to a friend, family or colleague?
- Is there anything you think we could improve to make the flying taxi experience even better?
- Would you use our flying taxi service again in the future?

Summarize everything you have learned into your final proposal

- Identify the target population. Why did you select that target population? What are their pain points?
- Create a product proposal containing claim, evidence, estimated impact, and risks
- Claims should be backed by quantitative evidence, impact should assess market needs/benefits
- Risks involve any known unknowns that we'll still need to monitor post-launch
- State cross-functional stakeholder teams that will need to be involved

- Identify the target population. Why did you select that target population? What are their pain points?

Target Population :

Users/passengers with 120k - 200k earnings and in the age group of 40-50 years.

Pain points:

- Heavy traffic
- Longer waiting time in traffic
- Env pollution due to heavy traffic.
- Longer waiting time for taxis

User Impact :

Faster transportation: When a user/passenger wants to travel from A to B. The time taken to reach B from A will be 70-80% faster than the conventional ground traffic

Reduce traffic in the city: As many users take flying taxi service, the no of cars or ground commute vehicles will be less and thereby reduces road traffic.

Increased Convenience: It will be convenient to reach remote places where there is no road access (like an island).

Business impact:

New business model: As it is a new business model there will be more opportunities for this model like Air ambulance, Vacation air taxi rentals, VIP transportation, Accident recovery services etc.
Economic growth: The growth of the flying taxi industry will generate a revenue by the taxi fare and more revenue opportunity like landing/takeoff pads, Charging stations and Flying taxi service centers ect.
Job creation: As the business grow there will be many new opportunities will be created by this.

- Opportunities in Tech side (Booking, Flying taxi monitoring and management, Operations)
- Opportunities in the manufacturing sector
- Opportunities in the landing/takeoff pads
- Constructing new infra for the flying taxi service.

Solution:

Pre Launch:

- Launch the website
- Release the app on both App store and Play store
- Start social media campaigning
    - Influencer campaigning
    - Google Ads, Insta, FB, Twitter, LinkedIn and Tiktok Ads
- Offline marketing
    - Articles on newspapers and magazines
    - Ads in Airports, City centers, Business centers

Announce a date for the launch of the new service. Youtube and social media videos with the influencers should run a month prior to the launch and make the public aware of the new concept

Launch:

- We shall start the service from the highly demanded pincodes/areas and the airports.
- On launch we should provide discounted rides a discounted referral programs for the users.
- As the demand increases we should launch at 4 new landing/takeoff pads in every month in new high demand locations.

Risks:

Safety concerns: Safety is the major concern of the new flying taxi service. Flying at high altitude in a new service is a real fear for public at least for the first time. We must invest in training the staff to ensure max safety of the passengers and making awareness program for users about the safety of the vehicle and the system.

Infrastructure: The landing/takeoff pads should be placed in the highly demanding localities like city center or business centers or airports or near public transportation hub. Finding and building the infra the place in such areas will be difficult or will be very expensive.

Regulatory issues: When there are more number of flying taxi vehicles on service will lead to more regulatory issues from the government side.

Public acceptance: The public may be hesitant to adopt flying taxis due to concerns about safety, noise pollution, and other factors. We should gain the trust of the public for the successful run.

Cross functional stakeholders.

- Software Development team
  - Front end engineering
  - Back end engineering
  - Data engineering
  - Infrastructure team
  - UX UI
- Marketing team
  - Digital marketing team
  - Social media campaign team
  - Offline marketing team
- Customer support and customer success team
- Operations team
- Legal team