



# Iterative Product Management

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- Roles of a Product Manager
- “Flyber” product development process:
  - Leveraging Data Science
  - Data Infrastructure
  - Iterative Product Design

# As a Product Manager



- Talking to users to empathize with their pain
- Leveraging data to understand macro/micro-trends (experiments)
- Creating solutions with engineers and designers
- Prioritizing the features and bugs in your backlog
- Building a roadmap of what we're building next
- Writing specs to translate your vision into reality



*Flyber*



### Data Science

Establishing  
a launch  
proposal

EDA, KPI, Hypothesis,  
instrumentation, final  
proposal



### Data Infrastructure

Planning for  
scalability

Data needs, modeling,  
ETL, BI



### Iterative Design

Sustaining  
and growing

KPI, A/B testing, funnel  
and cohort, feedback,  
hypothesis



# **Leveraging Data Science**

# Leveraging Data Science

*MVP launch strategy for a flying car taxi service, Flyber, in one of the most congested cities in America- New York City.*

- Raw data available-
  - User research data- ground taxi (age, gender, income, neighborhood, rideshare, flying taxi or not, willing to pay per mile, if no then why)
  - Taxi usage data- customer ID, pick-up/drop-off location + timing, duration(imputed), distance (imputed), pricing (calculated), distance-duration ratio (calculated)

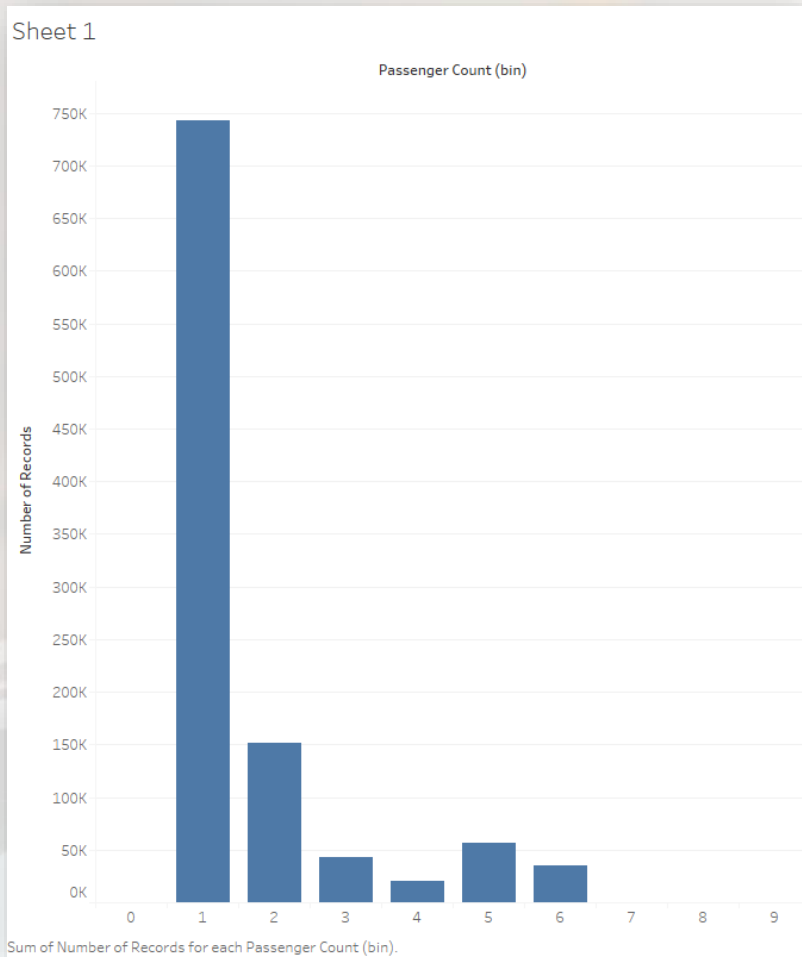
*Impute- moving average, KNN, NaN removal; Calculated: pricing calculator, equation based*

# Leveraging Data Science

- Decide on key questions to answer for the MVP launch:
  - Target usage for this service:
    - ride share
    - timing of day
    - weekly days
    - month in a year
  - Geographical: prime pick-up and drop-off locations
  - Target users:
    - Price per mile people are willing to pay
    - Income group of people who want Flyber

# Leveraging Data Science

- Target usage for this service:
  - Rideshare

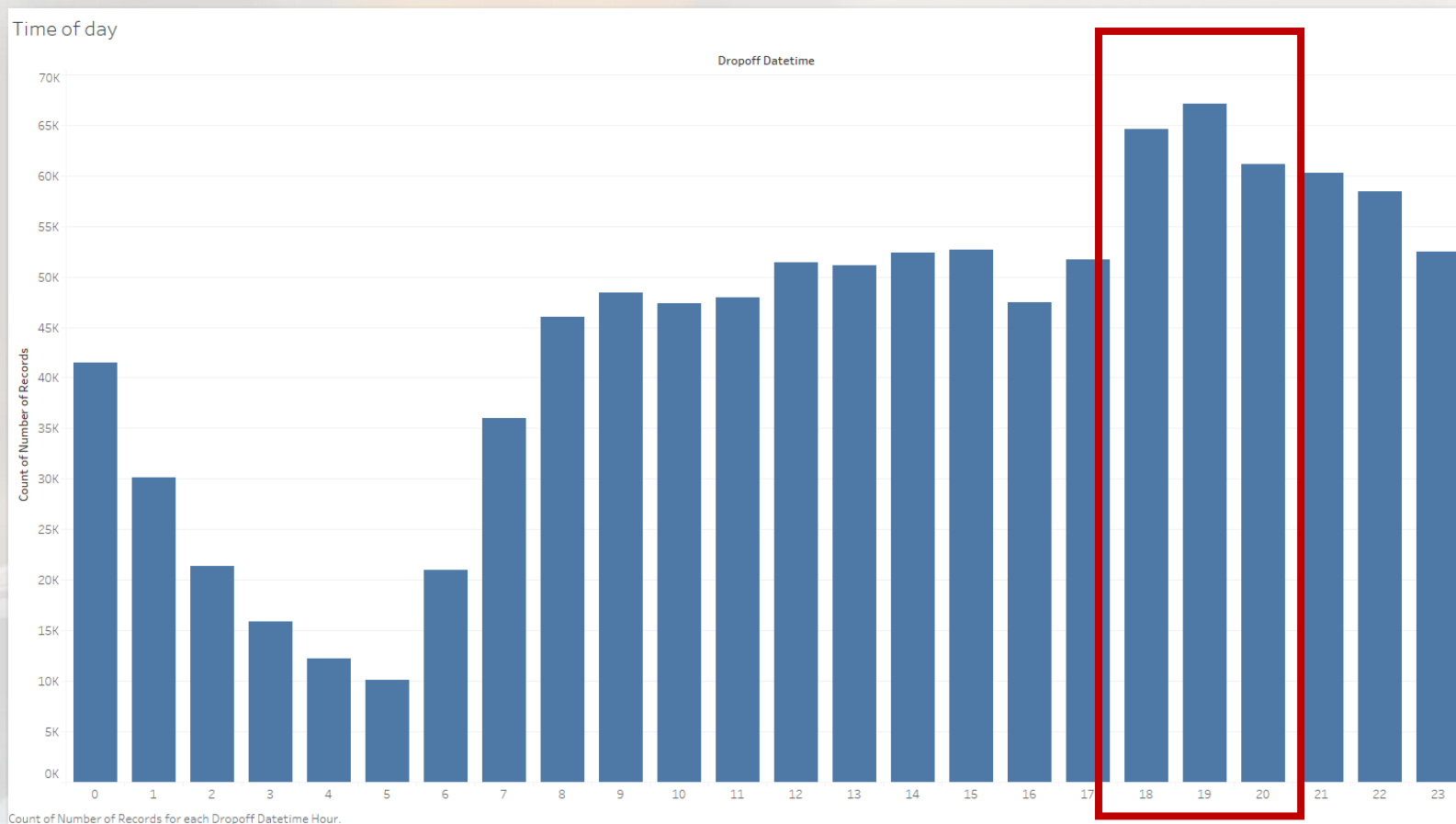


- Ride share and count indicates single users are by far the most frequent one.



# Leveraging Data Science

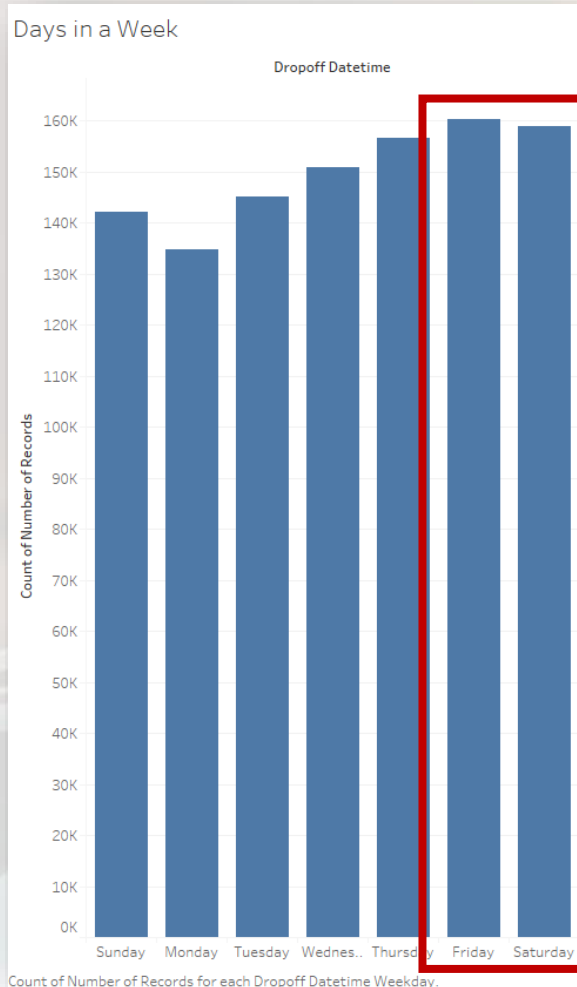
- Target usage for this service:
  - Timing of Day



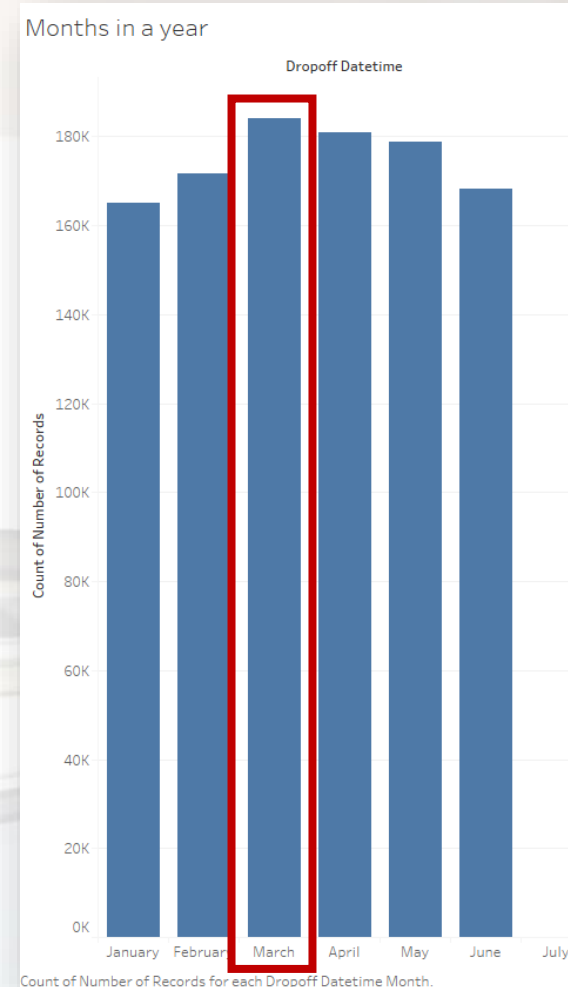
- During 1800 Hrs. and 1900 Hrs. of the day, higher volumes of ride pick-ups are observed.

# Leveraging Data Science

- Target usage for this service:
  - Weekly Days + Month in a Year



Fridays and Saturdays seem to be the most frequent days.



March is the most frequent month

# Leveraging Data Science

- Geographical- prime pick-up and drop-off locations

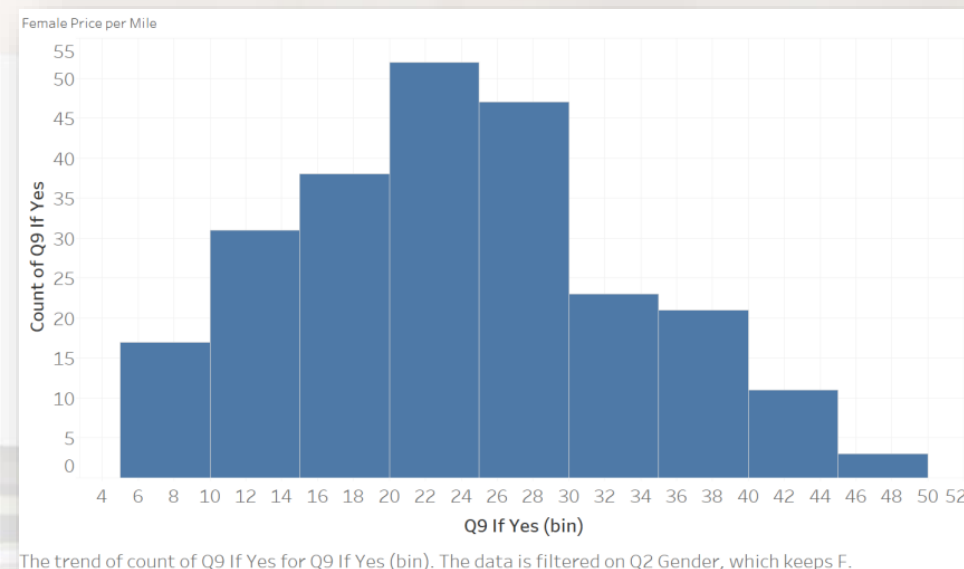
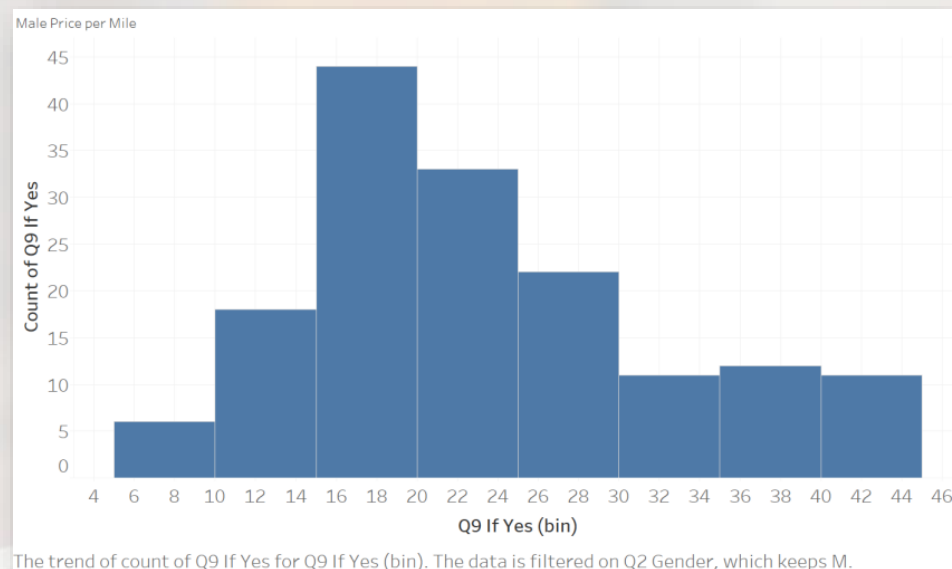
Pick-ups-  
Herald Square,  
Murray Hill,  
Manhattan,  
Midtown East

Drop-offs-  
Herald Square,  
Manhattan

TAXI

# Leveraging Data Science

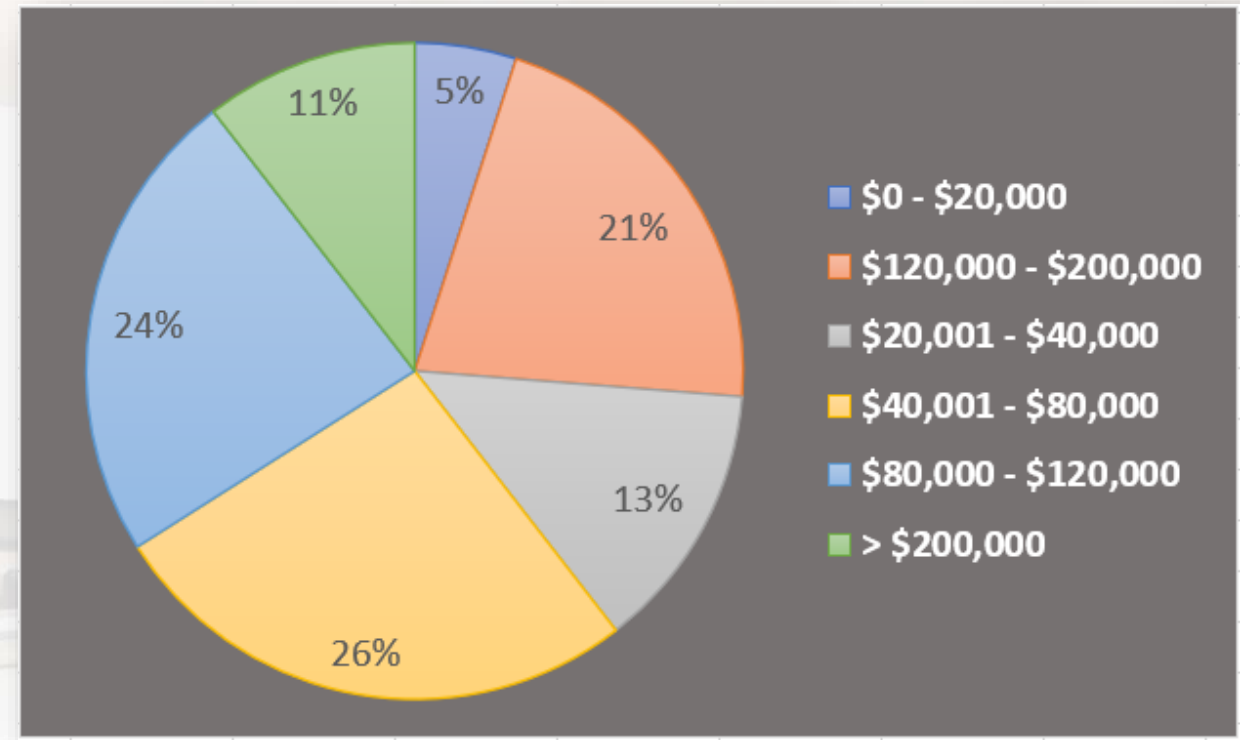
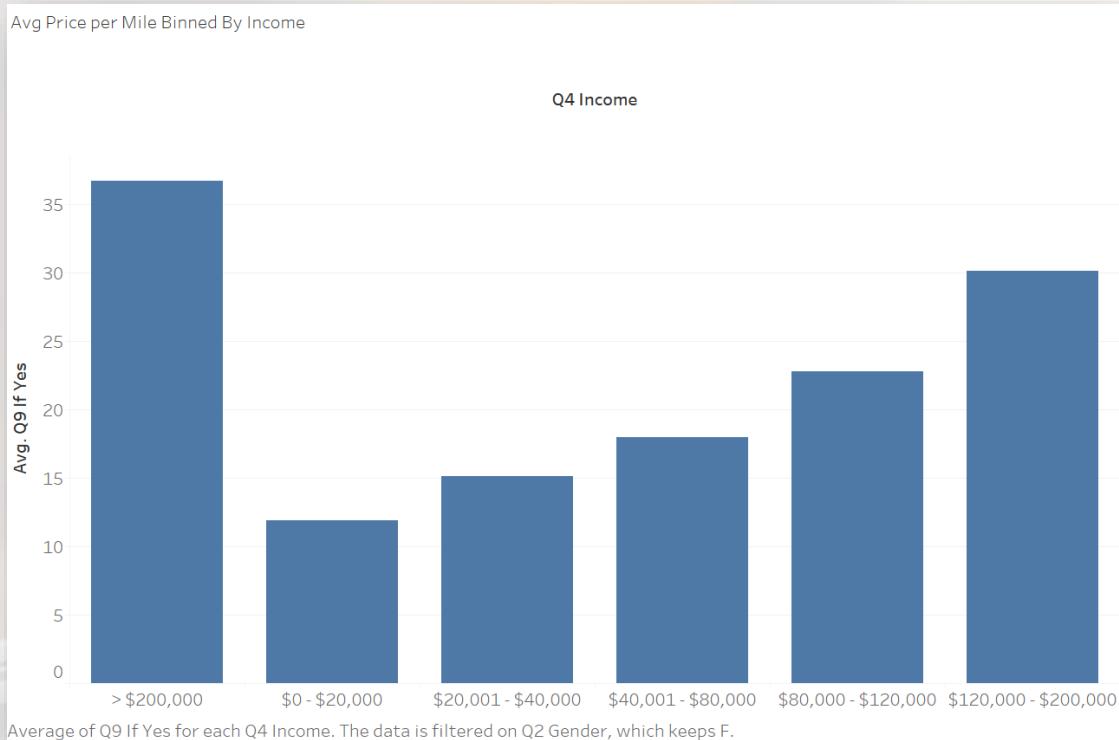
- Target users for this service:
  - Male and female age-based price per mile



Highest price bin in case of Males is \$15-20, and for Females is \$20-25

# Leveraging Data Science

- Target users for this service:
  - Income group of people who want Flyber



Potential price per mile based on income shows that the highest average price per mile belongs to the income bracket of >\$200,000, but the majority count of users is in the group \$80,000-\$120,000



# Leveraging Data Science

Observations so far:

Fridays and weekends during summer months, targeting individual users with income >\$200k & \$80k-\$120k with pricing ~25\$ a mile. Locations in favor are Manhattan and Herald square.

*Other inputs:*

- *Other observations showed that Manhattan and Herald Square have multiple buildings with landing pads or heli-pads*
- *To meet \$25 a mile, existing infrastructure and existing coptors should be preferred over home-grown tech.*
- *Pricing should be dynamic as time constraints are significant to the target users— gleaned from user research data*

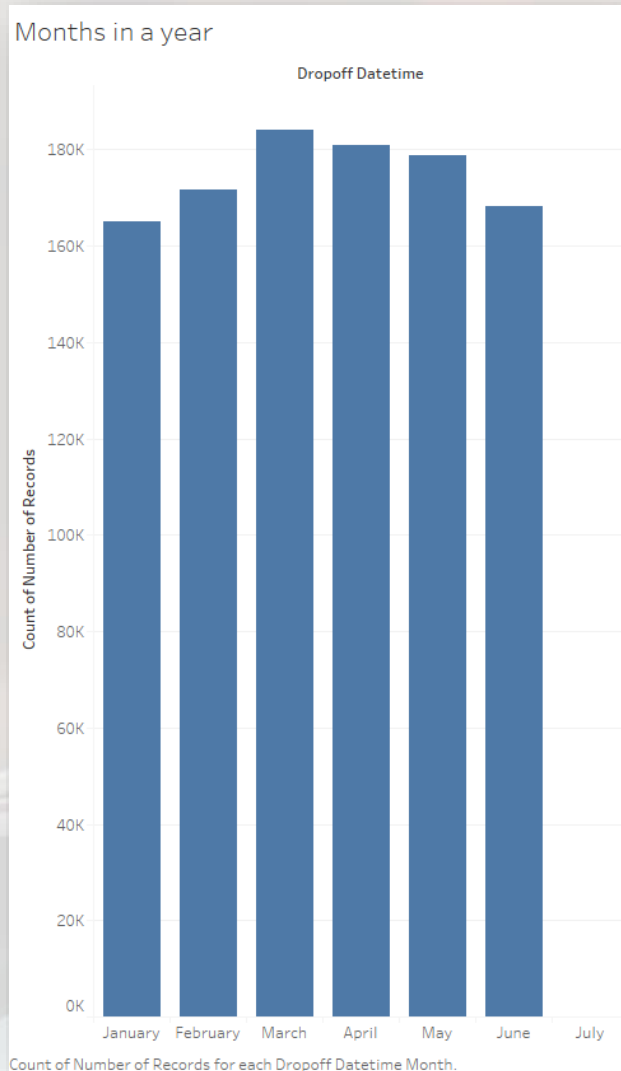
# Leveraging Data Science

Major KPIs:

- *Conversion rate of traditional taxi users to Flyber users (~20%)*
- Count of unique users with 2 or more rides should be above 30% of total users.
- Churn rate of customers who have stopped using the service after 3 months should be below 5-7%
- Existing customer revenue growth should not be negative
- Customer lifetime value should remain steady or grow. Decrease indicates losing of customers.

# Leveraging Data Science

## Sample Size and Time Period:



- Considering the total available data, for a conversion of 20% for taxi users to Flyber users, minimum detectable effect of 2.5% and significance of 95%, sample size required **~120,000 rides**.
- Assuming 10% of daily rides to be Flyber rides (~600), time period for validation would be =  $120000/600 = \text{~6months}$



# Leveraging Data Science

## Qualitative Feedback:

- Engagement notifications to Flyber service users:
  - When discounts are available
  - Feedback notification when ride ends
- Feedback survey/questionnaire for riders
  - How would you rate our travel and expense program? (1-10 scale and textbox)
  - How would you rate this ride? (1-10 scale and textbox)
  - What do you like best about Flyber? (textbox reply)
  - What features would you like added? (textbox reply)
- Tips for drivers (dollar amount)
- Chat capability for riders with Support
- Community forum for riders

# Leveraging Data Science

Final Proposal:

Claim: With New York traffic getting worse, A flying taxi service holds potential

Evidence:

- 80.16% of survey responders are in favor of a flying taxi service
- 6-month taxi revenue ~\$524 million (15% is \$157 million)
- With development of a new service, infrastructure, local community and government would be benefitted.
- Supplemental transport, reduced strain on current infrastructure

Risks:

- Initial technology and maintenance can be exponential
- Acceptance can be low
- Unknown regulatory, unions and pilot constraints

A photograph of a server room with rows of server racks. The scene is dimly lit with a strong blue hue. In the foreground, several server units are visible, some with glowing blue lights. The background is out of focus, showing more racks and a bokeh effect of yellow and white light spots. The text "Data Strategy" is centered in the middle of the image.

# Data Strategy

# Data Strategy

*As Flyber Grows, how do the original pipelines need to evolve?*

- Data Customers & Needs
- Data Collection and Modeling
- Extraction and Transformation
- Choosing Relevant Data
- Business Insights



# Data Strategy

- Data Customers & Needs

Stakeholder	Why are they Primary Stakeholder?	Use-Case
Engineering	Creates, designs and maintains the product	Monitor Flyer app and website and performance
Accounting	Recording the expenses and earnings of the business	Monitoring current profit and loss, develop future financial predictions
Customer Care	Handles customer grievances and issues	Provide personalized responses and record feedback from customers
Marketing	Acquiring new customers and retaining old	Targeting advertising, customer profiling and identifying opportunities in customer preferences

**Entity Data-** Customer ID, Ride ID, Complaint ID

**Event Data-** Pick-up/Drop-off location, duration of ride, Time of ride, Concerns submitted, Demographic data

*Other SH- Machine Learning, Reporting BI*



# Data Strategy

- Data Collection and Modeling

Table 1: Customer Details

Customer ID	First Name	Last Name	Address	Email	Phone
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Table 2: Ride Details

Ride ID	Customer ID	Pilot ID	Ride Cost	Pick-up Location	Drop-off Location	Duration	Pick-up Time
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Table 3: Complaint Details

Complaint ID	Customer ID	Concern	Date-Time of Submission	Status	Solution
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# Data Strategy

- Extraction and Transformation

Column	Details
event_uuid	Unique ID
user_uuid	Unique ID
event_time	Time and date
device_type	android, desktop_web, mobile_web, ios
session_uuid	Unique ID
user_neighborhood	Bronx, Brooklyn, Manhattan, Queens, Staten Island
event_page	book, driver, splash, search
event_type	open, search, request_car, choose_car, begin_ride

## Extraction:

- Gathering and analysis
- Verification (if relevant or not)
- Conversion of data types
- Consistency checks
- Duplication and missing values
- Organize for visualization

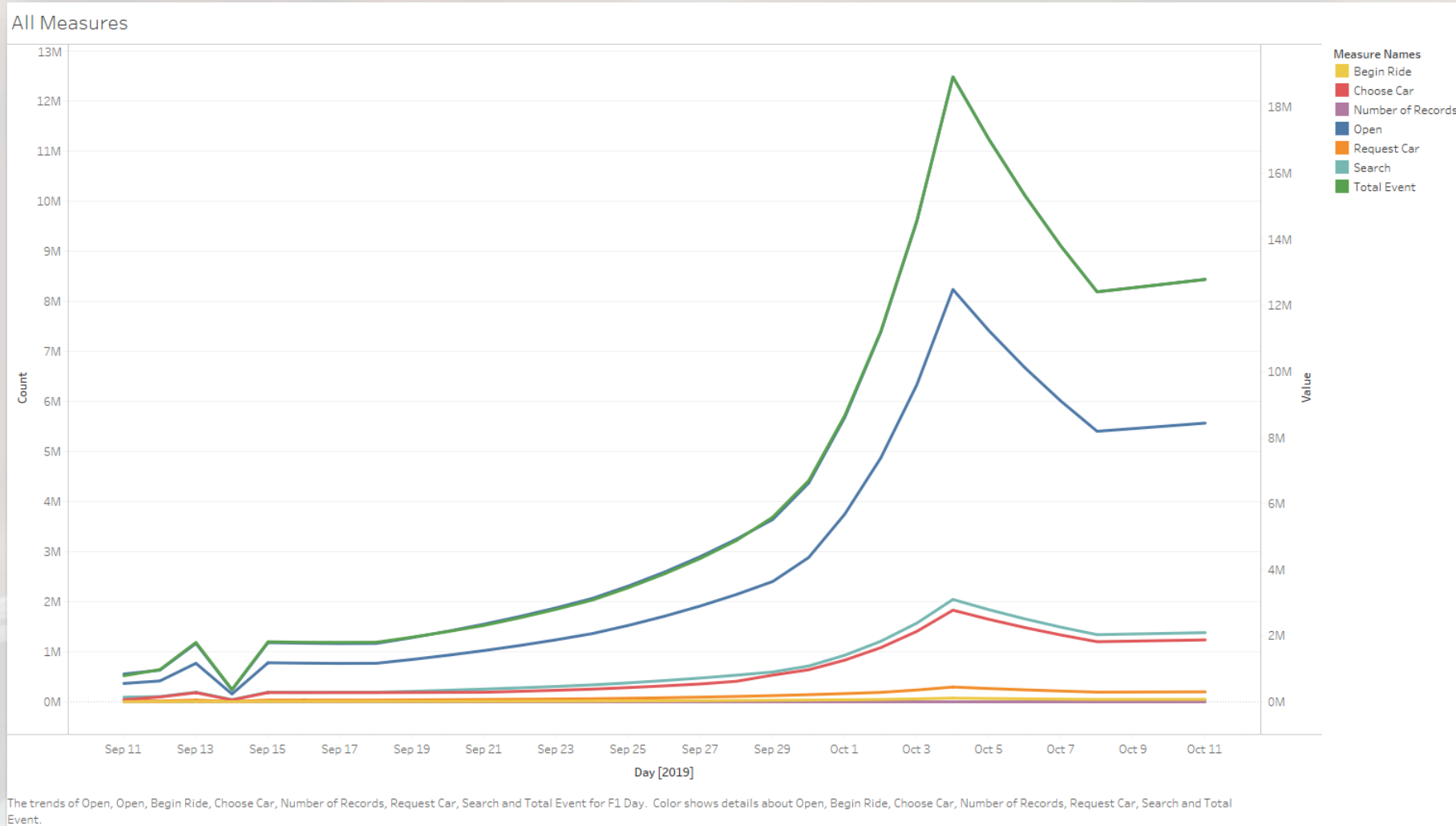
## Transformation:

Specific data to answer the questions:

- Number of events per day
- Events of each event type per day
- Events per device per day
- Events per page per day
- Events of each location per day

# Data Strategy

- Business Insights



- A marketing campaign was launched in the 1<sup>st</sup> week of October



# Data Strategy

- Scalability

- Cloud vs On-Prem and DWH:

Flyber being a start-up, cost, and in-house expertise would be limited and in such a situation, developing on-prem and in-house systems may be too cost intensive. In such a situation, using a Cloud DWH such as Snowflake or Amazon Redshift along with their technical support can be a great solution. As Flyber grows, these solutions would be scale with the company.

*Build vs Buy; In-house vs outsource, Open-source vs Commercial*

A top-down view of a collaborative workspace. Several people are seated around a table, their hands and arms visible as they work. The table is covered with various icons and diagrams. A large yellow circle in the center contains a lightbulb icon with three lightning bolts above it. To the left, a red circle contains an open book icon. To the right, a blue circle contains an eye icon. Below the central circle, there are two puzzle pieces, a magnifying glass, and a gear. The word "DESIGN" is written in the lower center, and "RESEARCH" is written in the lower left. There are also several colored circles (blue, green, orange, red) and a network diagram with nodes and lines. The overall scene suggests a creative and collaborative environment.

# Iterative Product Design

# Iterative Product Design

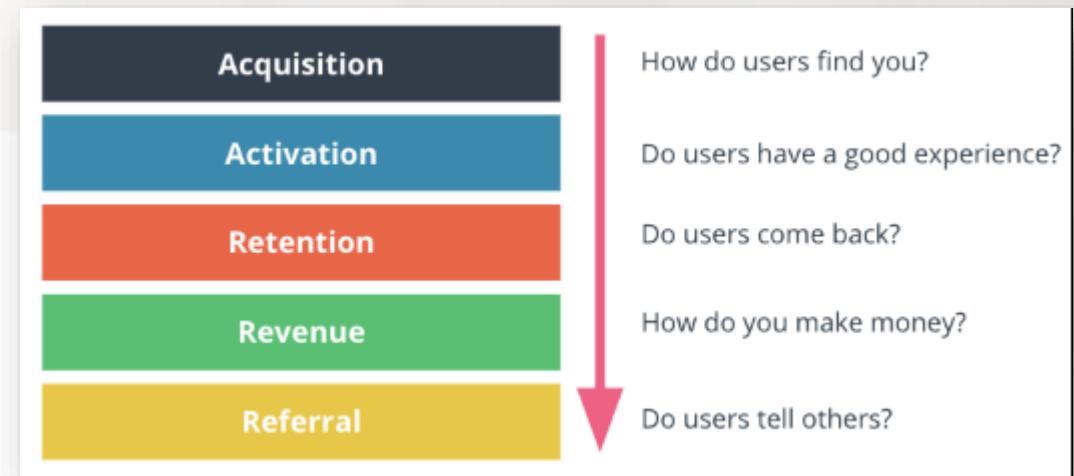
*As Flyber Grows, how do we track and constantly improve?*

- KPIs 2.0
- Multi-variate testing
- Funnel and Cohort analyses
- Feedback Analysis
- Hypothesis and next steps



# Iterative Product Design

- KPIs based on Event data available:
  - Count of unique customers per day
  - Total rides:  
Daily/Weekly/Monthly/Quarterly
  - Number of rides per neighborhood
  - Conversion rate between Customers who open the app and Customers who start a ride



**AARRR... Pirate Metrics**

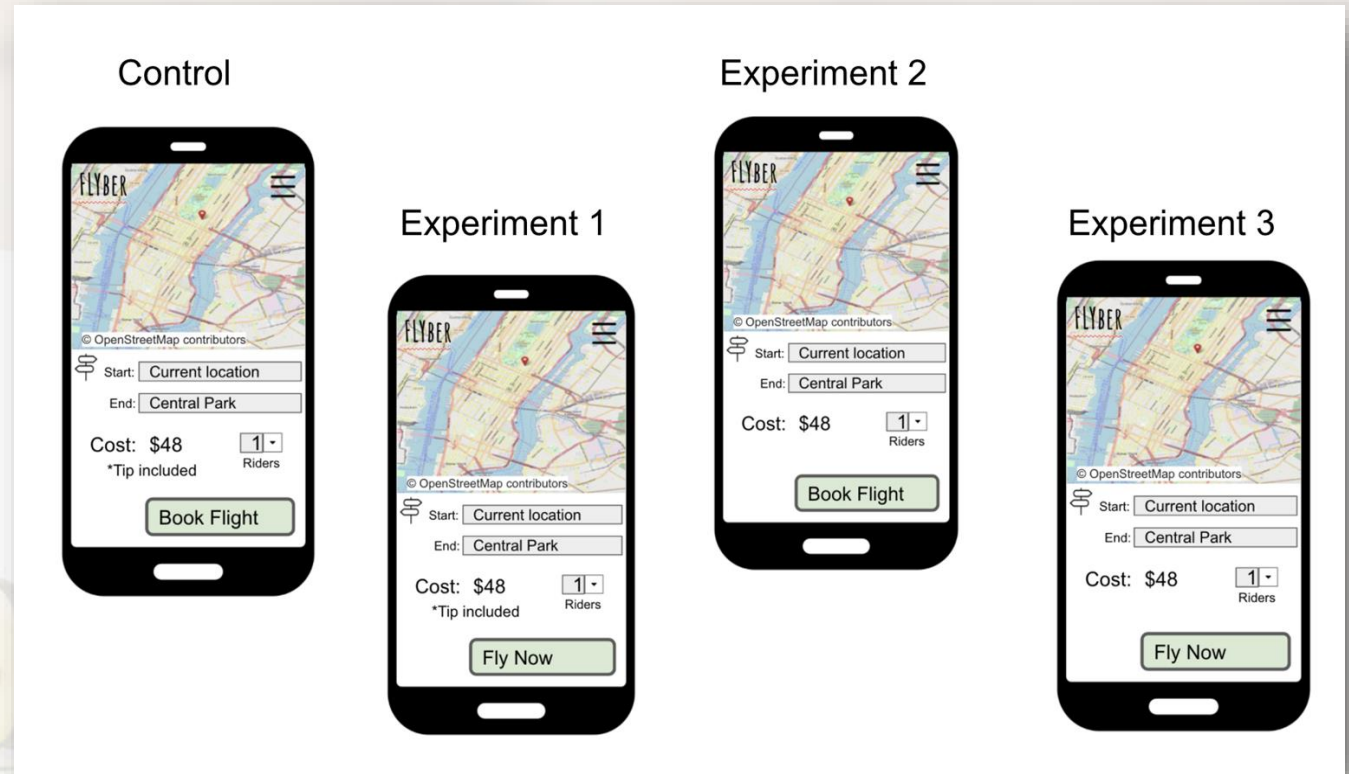
# Iterative Product Design

- Multi-variate testing

**Experiment 1:** The “Book Flight” button is changed to “Fly Now” in comparison to Control

**Experiment 2:** The “\*Tip Included” information is removed in comparison to Control

**Experiment 3:** Both the changes in Exp. 1 and Exp. 2 are made in comparison to Control





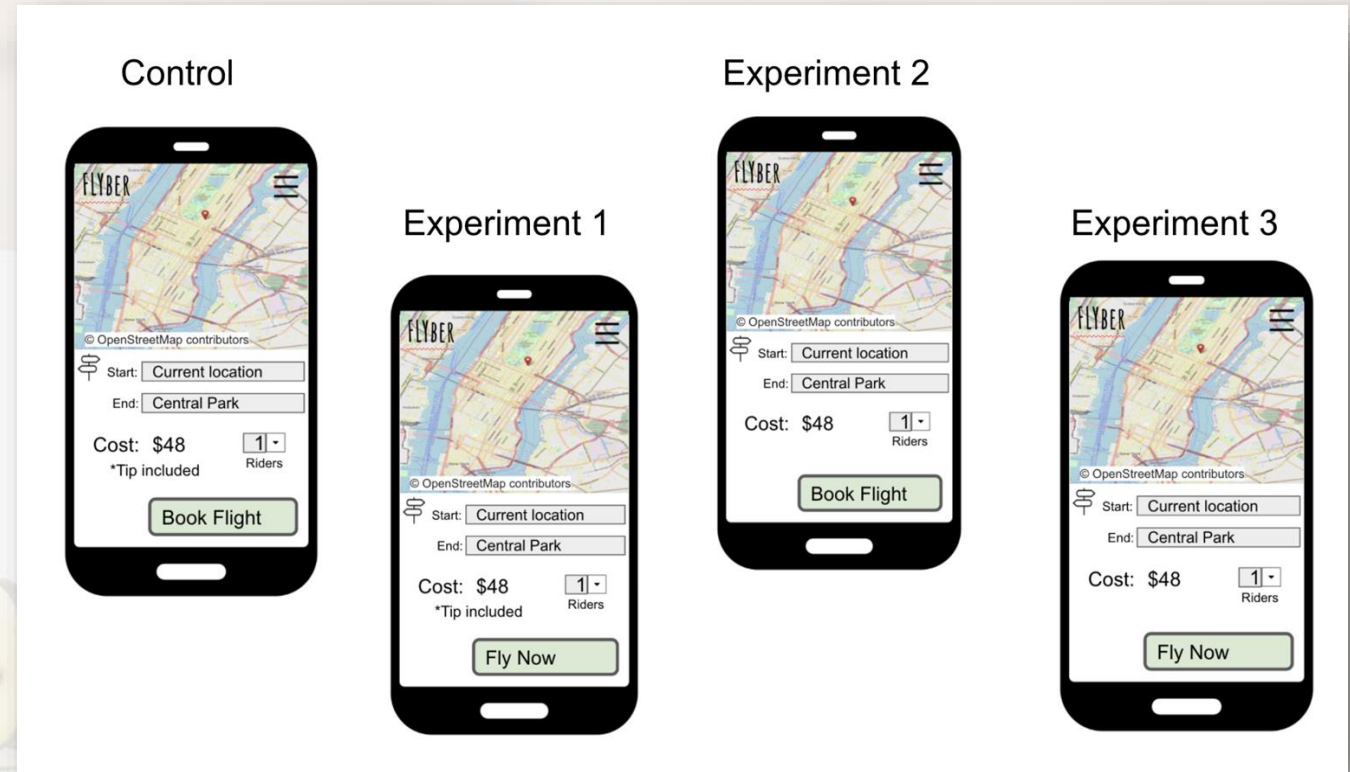
# Iterative Product Design

- Multi-variate testing

***Control vs Experiment 1: p-value = 0.1590, which is not  $< 0.025$ , hence not statistically significant!***

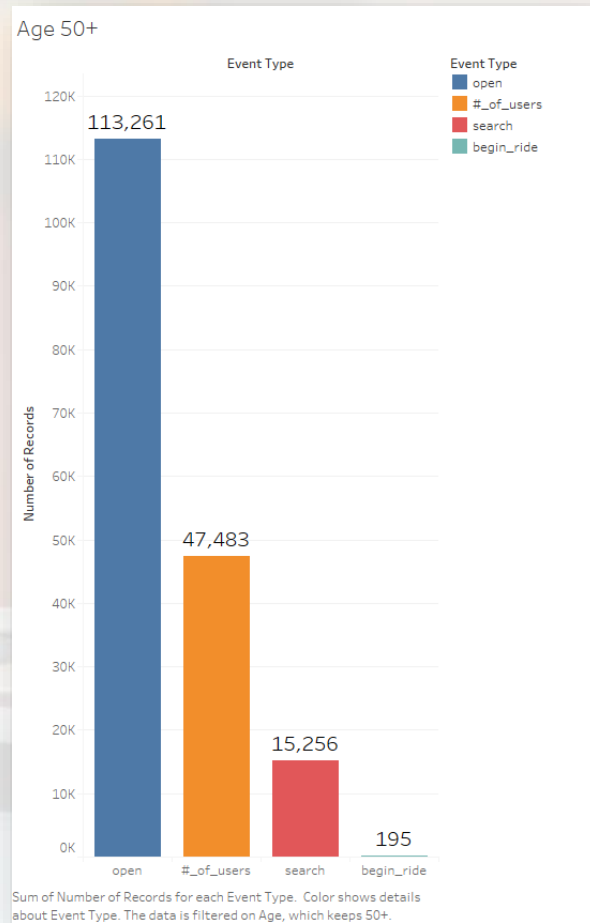
***Control vs Experiment 2: p-value = 0.0843, which is not  $< 0.025$ , hence not statistically significant!***

***Control vs Experiment 3: p-value = 0.1848, which is not  $< 0.025$ , hence not statistically significant!***



# Iterative Product Design

- Funnel and Cohort analyses
  - Open app → Choose # of riders → Search ride → Begin ride



In 50+ age:  
Highest drop-off going from Search  
to Begin ride

# Iterative Product Design

- Under-performance, Hypothesis and next steps

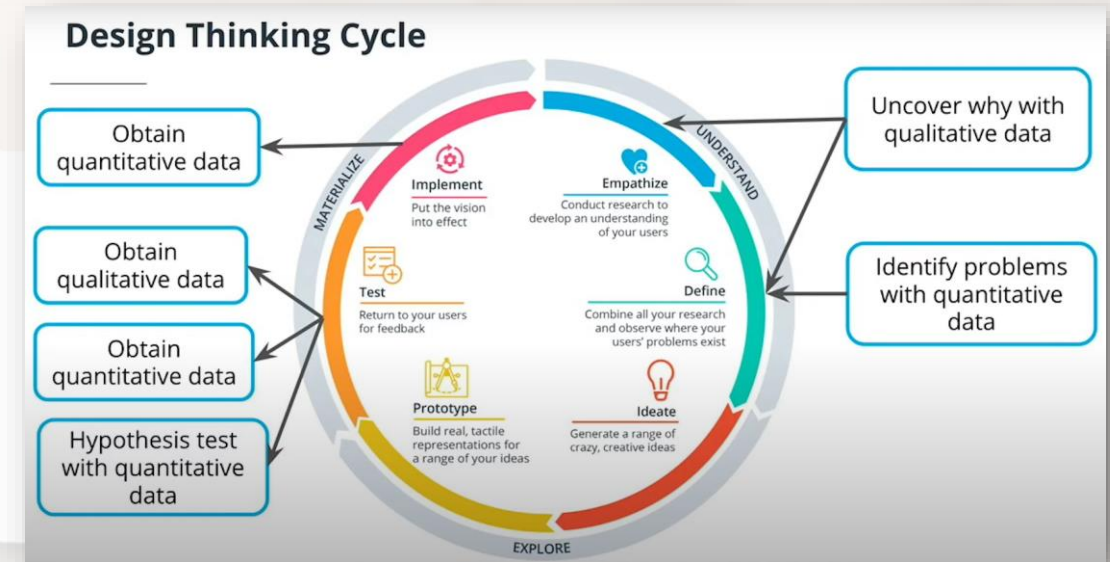
Reasons:

- Booking process is too long
- Instructions are too small

Hypothesis:

Changing layout of instructions and simplifying booking process, can show an increase of 4 books per day

Cost (computation + data storage + labor) Payoff period: ~3 months



RICE Score Based prioritization

$(\text{Reach} * \text{Impact} * \text{Confidence}) / \text{Effort}$



# Key Takeaways

- KPIs can be contradictory, hence should be selected based wholistic understanding, and early indicators are useful
- Planning is based on current knowledge, hence always keep scope for flexibility
- On a personal level: be ready to fail often, learn quickly and apply even faster!



*Thank  
You*