

Applying Iterative Design Principles to a Live Product





Step 1
Select KPIs
&
Evaluate Previous
Multivariate
Experiment Results

Select KPIs for Flyber Analyses

- For the data available, which KPI(s) best match Flyber's business model?
 - Daily Active Users
 - Conversion Rate
 - Bounce Rate
- How would you calculate these KPI(s) using the available event data logs?
 - Daily Active Users: Number of users who 'open' the app and 'search' daily
 - Conversion Rate: Ratio number of users who 'book' a ride/Total number of users 'opening' the app
 - Bounce Rate: %age of users abandoning the booking process after opening the app
- List other KPIs that might be important to Flyber but are not calculable based on available data
 - CAC: Customer Acquisition Cost
 - Customer Satisfaction Score
 - Monthly Active users
 - Retention Rate

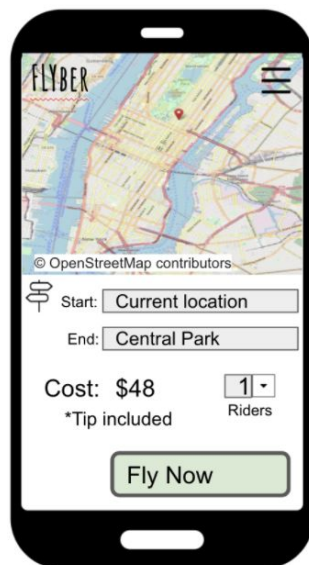
Describe the First Multivariate Experiment

- Describe the elements tested during the multivariate experiment. You can use the image below when referencing the tests.

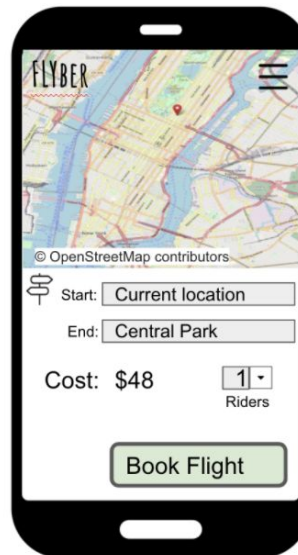
Control



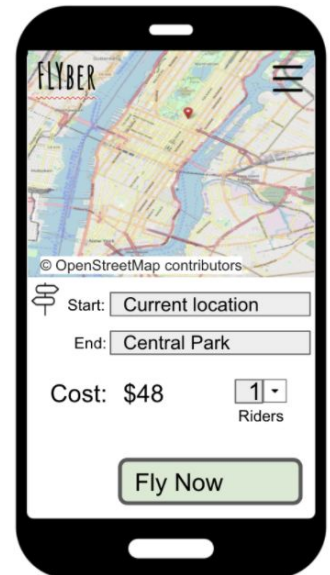
Experiment 1



Experiment 2



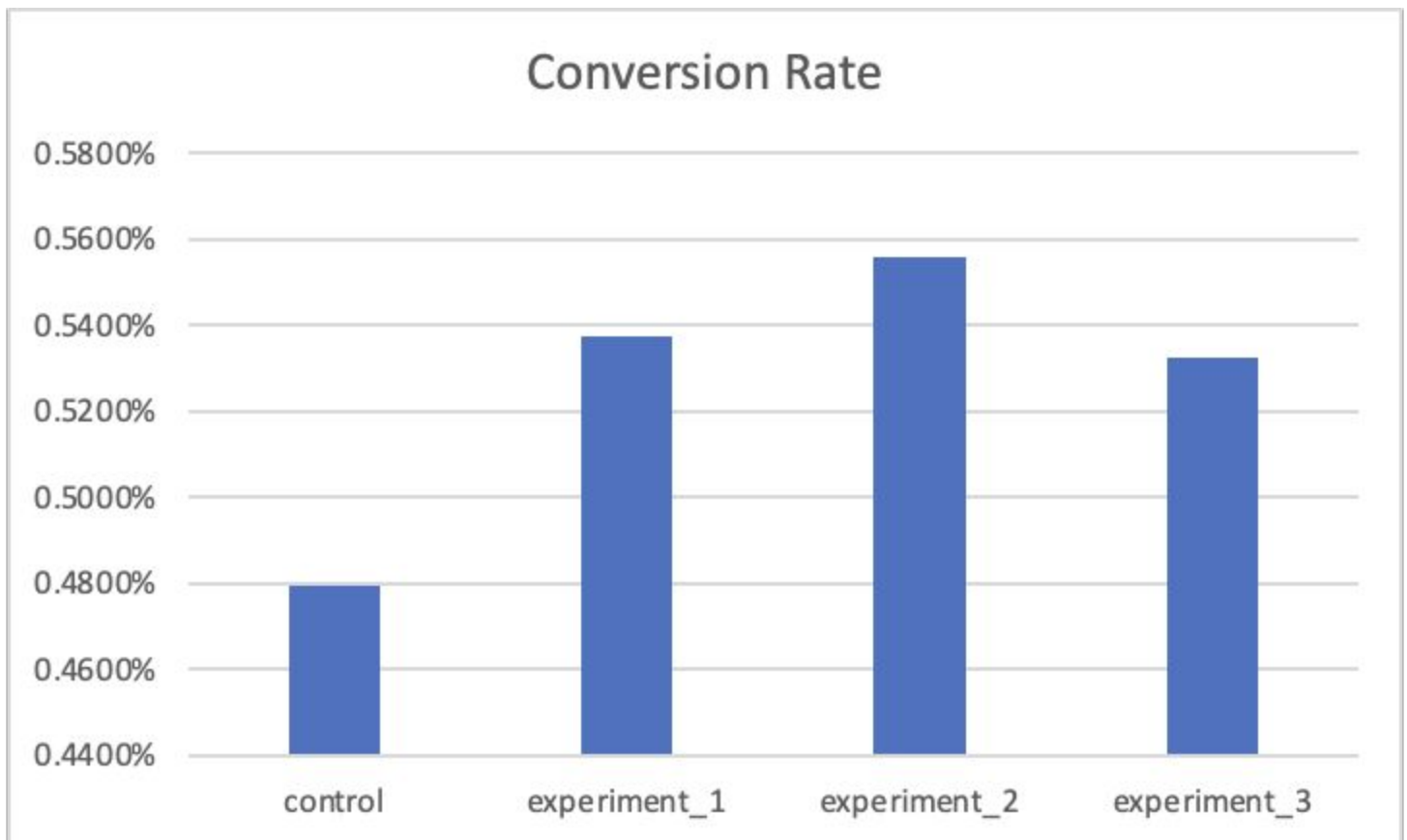
Experiment 3



- The multivariate testing tests small changes namely button text and inclusion of the text '*Tip included' in the booking page of the app. Thus there are total 2x2 different states. There is one control state and 3 experiments
 - Control: Button text: 'Book Flight' Cust Subtext: '*Tip included'
 - Experiment 1: Button text: 'Fly Now' Cust Subtext: '*Tip included'
 - Experiment 2: Button text: 'Book Flight' Cust Subtext: None
 - Experiment 3: Button text: 'Fly Now' Cust Subtext: None

Review Multivariate Test Results: Visualization

- Provide a visual representation of the impact of the experiment on the conversion rate of users booking a flight (out of all users opening the app)



Review Multivariate Test

Results: Significance Test

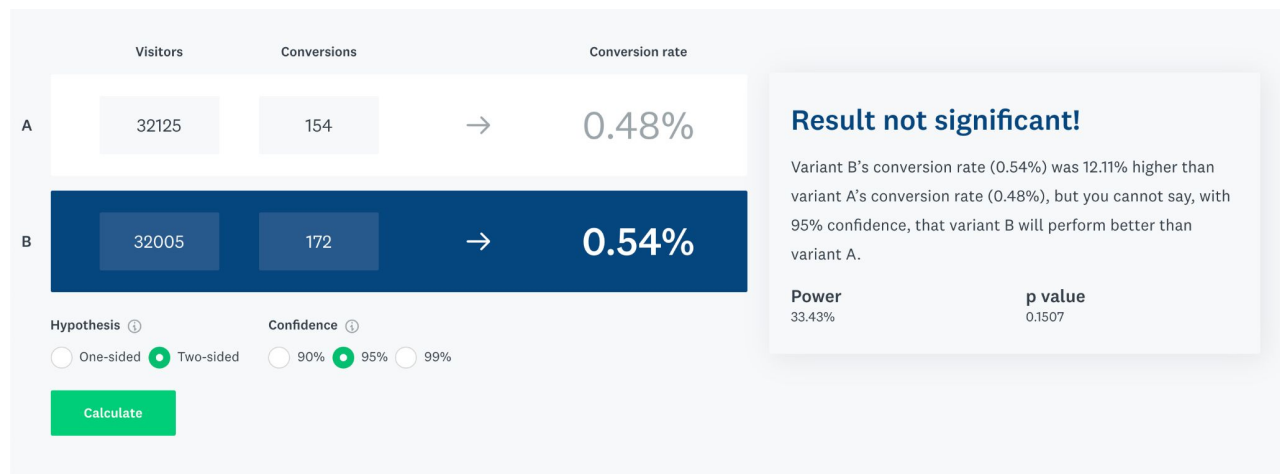
Determine if there was a significant difference between the experiments and control states.

- Null Hypothesis: There is no difference in the conversion rates between the control and experiment groups
- Alternate Hypothesis: The Experiment group has a different conversion rate than the Control group
- We perform a two-tailed t-test with a confidence interval of 95% for each experiment
- We use a T-test calculator to compare our control group to experiment 1,2 and 3 one by one and check the statistical significance of each

Review Multivariate Test Results: Significance Test

Determine if there was a significant difference between the experiments and control states.

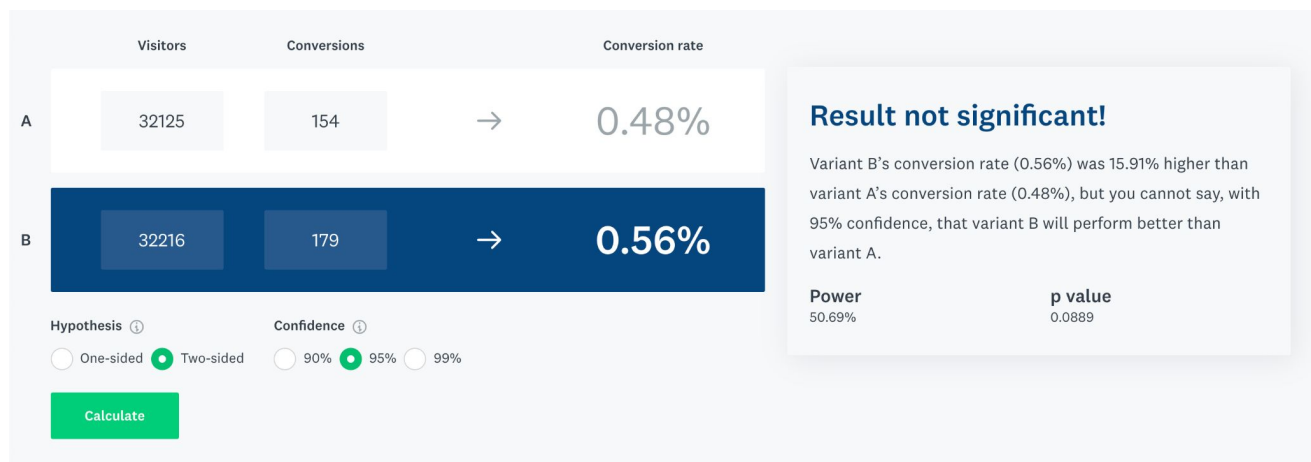
- Control vs Experiment 1:
 - We see that the t-test results in a p-value of 0.1507, which is greater than 0.025. Hence the result is not statistically significant



Review Multivariate Test Results: Significance Test

Determine if there was a significant difference between the experiments and control states.

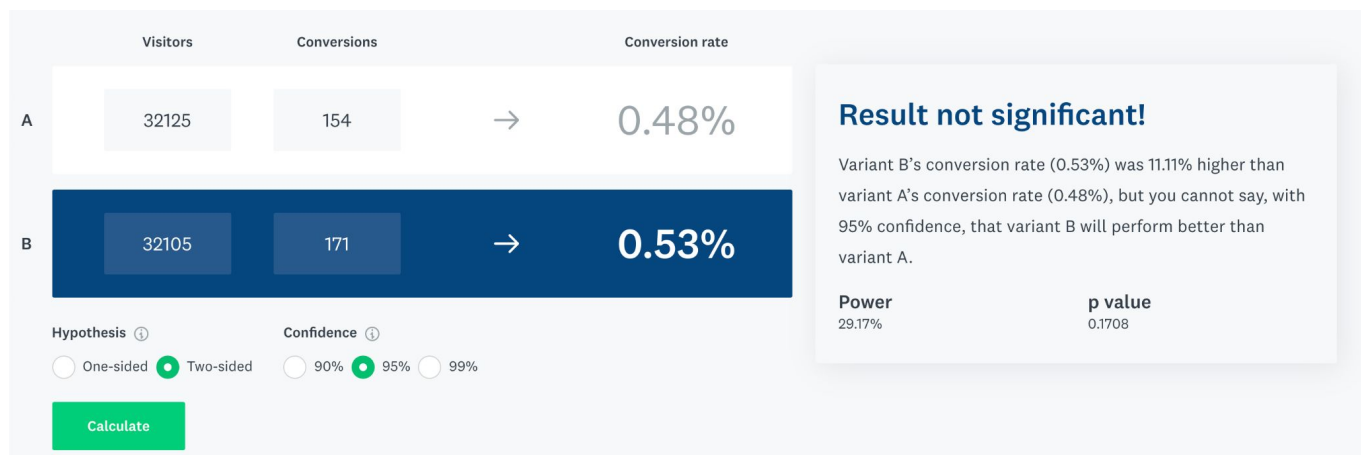
- Control vs Experiment 2:
 - We see that the t-test results in a p-value of 0.0889, which is greater than 0.025. Hence the result is not statistically significant



Review Multivariate Test Results: Significance Test

Determine if there was a significant difference between the experiments and control states.

- Control vs Experiment 3:
 - We see that the t-test results in a p-value of 0.1708, which is greater than 0.025. Hence the result is not statistically significant.



Thus none of the 3 experiments result in a statistically significant result. Thus none of the experiment should be expanded and we should keep experimenting



Step 2

Funnel & Cohort Analyses

User Funnel

Identifying the different stages the user funnel

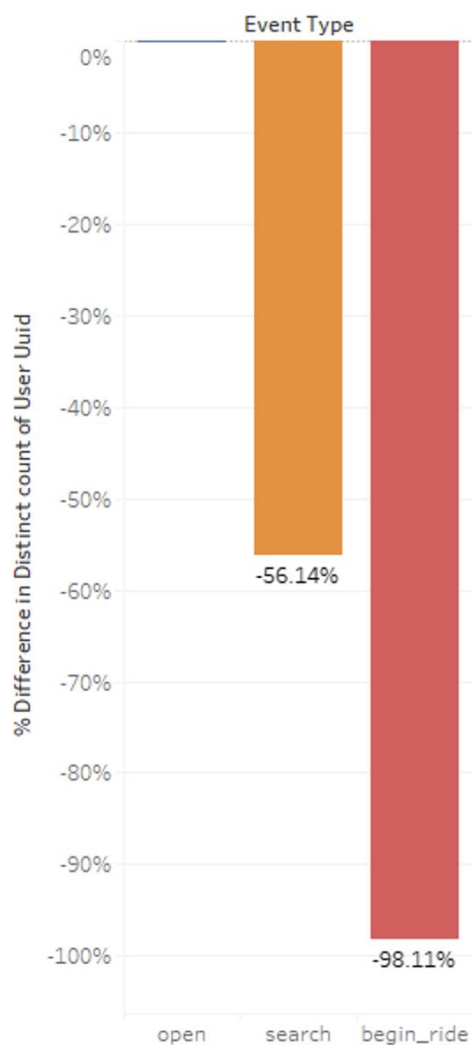
- Based on the event types in the data provided, list the 3 or more steps a user can take from opening the app to final booking of a ride
- Provide a graph showing the funnel from step to step, including drop off rates.

User Funnel

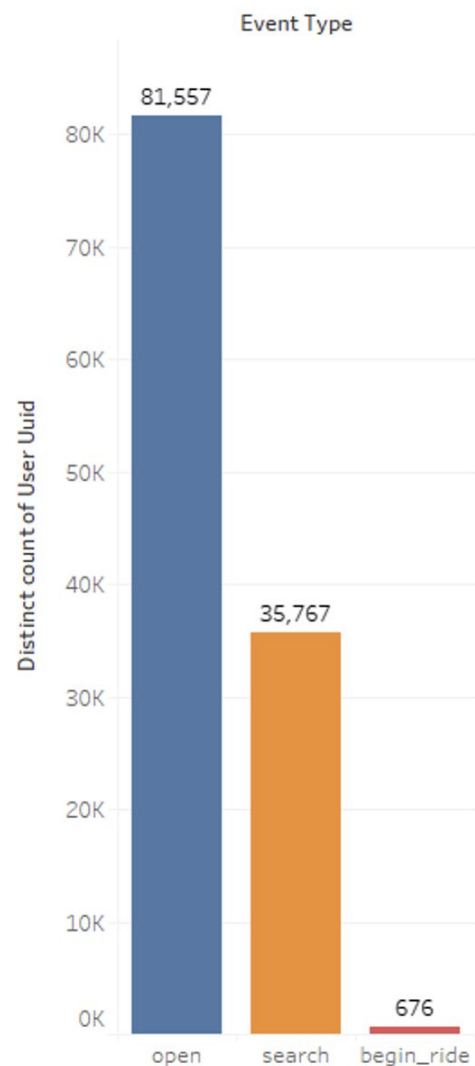
Identifying the different stages the user funnel

- User Funnel Stages
 - a. open
 - b. search
 - c. begin_ride

Drop Off Rates in User Funnel Stages



User Funnel Stages



User Segments

- Identify 2 demographic attributes present in the data that allow for segment analysis
- For each demographic attribute, provide the number of users in each segment group
- For each demographic attribute, identify the segment group with the largest number of users

User Segments

- The two demographic attributes present in the data are age groups and neighbourhood locations
- Neighbourhood: Largest segment is Manhattan

User Neighborhood				
Bronx	Brooklyn	Manhattan	Queens	Staten Island
2,396	16,435	57,110	4,050	1,566

- Age Groups: Largest segment 50+

Age			
18-29	30-39	40-49	50+
28,321	20,124	41,774	64,059

- For both attributes together: Largest segment is people in the age group 50+ living in Manhattan

User Neighborhood					
Age	Bronx	Brooklyn	Manhat..	Queens	Staten Island
18-29	841	5,767	19,813	1,374	526
30-39	623	4,044	14,060	1,024	373
40-49	1,213	8,460	29,184	2,089	828
50+	1,878	12,905	44,888	3,158	1,230

Segment Analysis of Funnel

Identify Opportunities for Improvement

- Perform a funnel analysis by segment for all identified demographic attributes and describe the results
- If underperformance for a segment in an attribute is identified, add a visual showing the average funnel conversion by segment group for that demographic

Segment Analysis of Funnel

Identify Opportunities for Improvement

- Funnel Analysis for Neighbourhoods:

Event Type	User Neighborhood				
	Bronx	Brooklyn	Manhattan	Queens	Staten Island
open	2,396	16,435	57,110	4,050	1,566
search	1,053	7,200	25,051	1,777	686
begin_ride	23	134	474	31	14

Event Type	User Neighborhood				
	Bronx	Brooklyn	Manhattan	Queens	Staten Island
open					
search	-56.05%	-56.19%	-56.14%	-56.12%	-56.19%
begin_ride	-97.82%	-98.14%	-98.11%	-98.26%	-97.96%
Grand Total					

- We can see that across all neighbourhoods the drop off rates are largely the same. Hence we can conclude that there is no effect of neighbourhood on the conversion rates.

Segment Analysis of Funnel

Identify Opportunities for Improvement

- Funnel Analysis for Age Groups:

Event Type	Age			
	18-29	30-39	40-49	50+
open	28,321	20,124	41,774	64,059
search	8,692	5,834	13,945	14,035
begin_ride	126	100	256	195

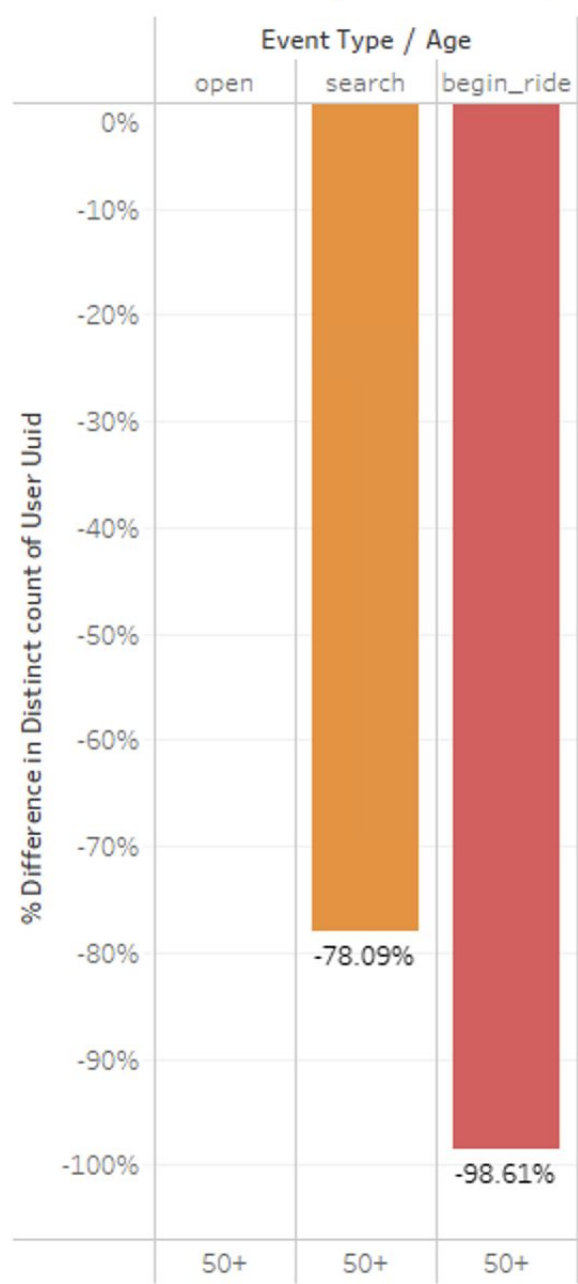
Event Type	Age			
	18-29	30-39	40-49	50+
open				
search	-69.31%	-71.01%	-66.62%	-78.09%
begin_ride	-98.55%	-98.29%	-98.16%	-98.61%

- We can see that the drop off rates for the age groups 30-39 and 50+ from opening the app to the searching for a ride is higher. Since the 50+ segment is largest in the age group, we focus on this segment

Segment Analysis of Funnel

Identify Opportunities for Improvement

User Funnel Drop off for Age Group 50+





Step 3

Hypothesis & Next
Steps

Review Qualitative Data

- Read user interviews to understand “why” any funnel under-performance seen in Step 2 might occur
- List your hypothesis for what customer need is being under-served
- Provide 3 or more quotes as evidence for this hypothesis

Review Qualitative Data

- From the user interviews, we see that the demographic age group 50+ find it difficult to use the app. Many of our interviewees find it easier to book a cab through their assistant or by calling a taxi service. Thus they are not accustomed to using an app to book transportation.
- The current user experience and interface are not satisfying the customer needs. They find it difficult to use. We can see this by the following:
 - "Generally if a showing runs late, I will pull out my phone and open up the app and call a Flyber. I prefer to use text-to-speech which I can't do with Flyber so it can be a little annoying when I'm already in a hurry."
 - "Before Flyber, I'd call a taxi service on the phone."
 - "Drive my car or call a taxi service."
 - "I have a personal car service on call. My assistant books Flyber whenever I'd be travelling during peak NYC traffic hours. Time is money and Flyber saves me time! But I let my assistant actually book the Flyber because the first few times I tried booking, the instructions were too small."
 - "I call up our local pilot, Bob. He's not always available but I don't need to fiddle around with an app and hitting tiny buttons. He knows where I tend to be and where I want to go."

Suggested Features & Experimentation Plan

- Share your hypothesis using the following format: We believe [observed quantitative effect] Because [hypothesized user “why”] And that by [general change/opportunity for Flyber to improve] for [targeted cohort] we will see [expected effect]
- Suggest 2 or more features that would match your hypothesis and determine a plan for multivariate testing, including describing the control and experimental conditions
- Determine who should be exposed to the experimental changes
- List any additional metrics that would be helpful to collect from your suggested features

Suggested Features & Experimentation Plan

- Hypothesis: We believe the 78% drop off from opening the app is Because our customers in the age group 50+ find the UI and UX difficult to use. By improving the UX by adding a new interface for Age group 50+ we will see an increase in conversion rates
- Suggested features:
 - Integrating the app into google assistant so that users can book flyber with their voice in the assistant than using the app.
 - A NLP within the app that prompts the user for 'destination location' and 'booking time'. The user can speak with the app directly and book the cab, than having to use the UI.
- Multivariate testing:
 - Control: Existing current state of the app
 - Experiment 1: Google Assistant integration
 - Experiment 2: NLP within the app with voice interface
 - Confidence Interval of 95%
- The experimental changes should be exposed to all our customers so that we can detect any positive or negative effects of the new features on age groups other than 50+ as well. Users across age and neighbourhoods, should be balanced across all groups: control, experiment 1 and experiment 2
- Additional Metrics:
 - Time taken to book an app in experiment vs control
 - Number of times booking process has been restarted because of error in voice input
 - Voice input errors



Appendix

Raw Data