

Tell us of a problem with a product which bothers you.

- How would you use technology to solve the problem?
Propose more than one potential solutions (max 3).
- Compare and choose the best solution for the problem.
- How would you measure whether the proposed solution is working?
- What might be the reason for this solution to fail ?



UBER Pool

A product management case study for Flipkart's APM Programme by Dhavala V S Aditya

Problem : The Pool Experience

Uber



Long Waiting times

Secondary passengers experience long waiting times because booked cab is far away from route. Leads to bad UX.



Long Journey times & Circuitous Routes

Primary passengers often experience long journey times because booked cab needs to travel circuitous routes to facilitate picking up of other passengers. Leads to bad UX.



Rides often inefficient

Cabs may fit 4 people at a time but usually don't fit that many on single Pool ride. Opportunity Cost for UBER. (Lesser riders per/km)



Psychological

Both riders and drivers don't like to change routes in the middle of their rides. That uncertainty induces psychological stress. Leads to bad UX.

Root Cause Analysis

*Root Cause for Psychological problems is irrelevant to our scope. The primary cause for psychological stress is the pain point caused due to circuitous pickup.



Long Waiting times

Why are there long waiting times?

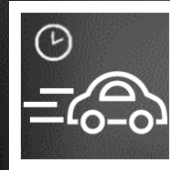
It isn't known where & when exactly rides will pop up.

Why don't we know the location & timing of higher number of riders?

Uber does have a time & location based demand forecasting model.

Why even after demand forecasting are there long wait times?

Even knowing about high probability of pickup at a location, driver needs to stick to the route unless confirmation is provided.



Long Journey times

Why are there long journey times?

Uber algorithm follows long and circuitous route for picking up additional passengers.

Why does Uber algorithm follow long and circuitous route?

Uber doesn't know beforehand the exact location and time at which rides are being booked.

Why doesn't UBER know?

Uber only has demand forecasting. The route can be modified to optimise journey times only when it is confirmed that a new rider can be found at the location.



Rides often Inefficient

Why are there inefficient rides caused?

Inefficient rides are caused when there are lesser people than there can be in the cab.

Why are there lesser people in the cab?

Long waiting times induce secondary riders to cancel rides, lowering efficiency.

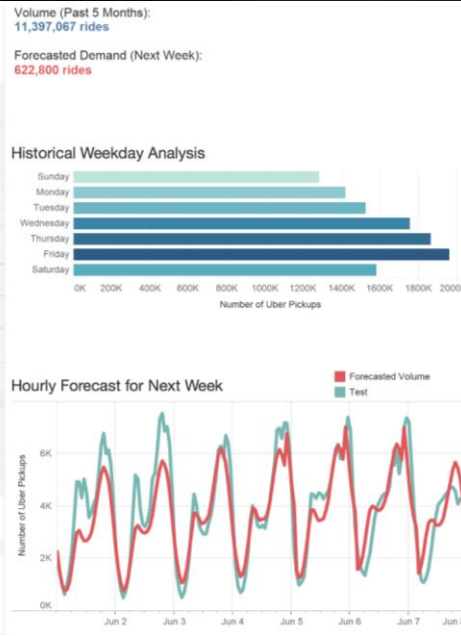
Why are there long waiting times?

Already answered

Alternatives

1. Demand Forecasting Model (Current)

Predicts probability of rides from specific locations and times based on previous demand data.



ADVANTAGES

Primary passenger waiting time reduced.

LIMITATIONS

No reduction in secondary passenger waiting time.

No improvement in efficiency.

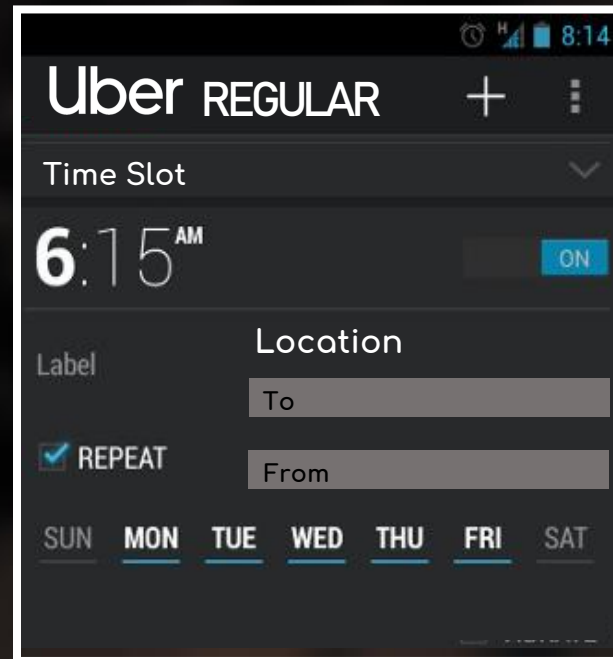
No improvement in Psychological stress.

2. UBER Regular Pool Scheduler

Need: We need to confirm beforehand exactly where & when riders are going to turn up.

Proposed Solution:
Feature to let people schedule rides for a period of time beforehand eg. Students can set rides for a whole week at once.

Now we can use this data to optimise routes, assign drivers and co-riders beforehand & notify users about this.



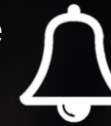
ADVANTAGES



Eliminate concept of waiting time. Guaranteed cab for specified slot.



Best Case Pool scenario for Journey times & efficiency can be optimized.



Notifications detailing routes, journey times and driver details sent beforehand



2 pain points (Uncertainty due to circuitous routes, hassle of booking each time) eliminated

LIMITATIONS



Can't completely replace real time ride booking, meant for specific target segment.



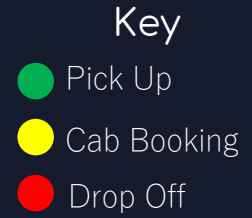
Ride times still not as ideal as UBER X & UBER Go.

Uber

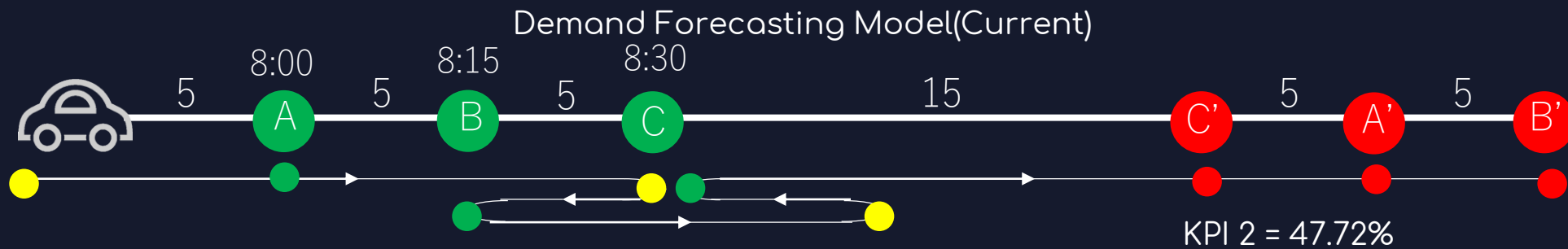
Algorithmic Comparison

Key Performance Indicators:

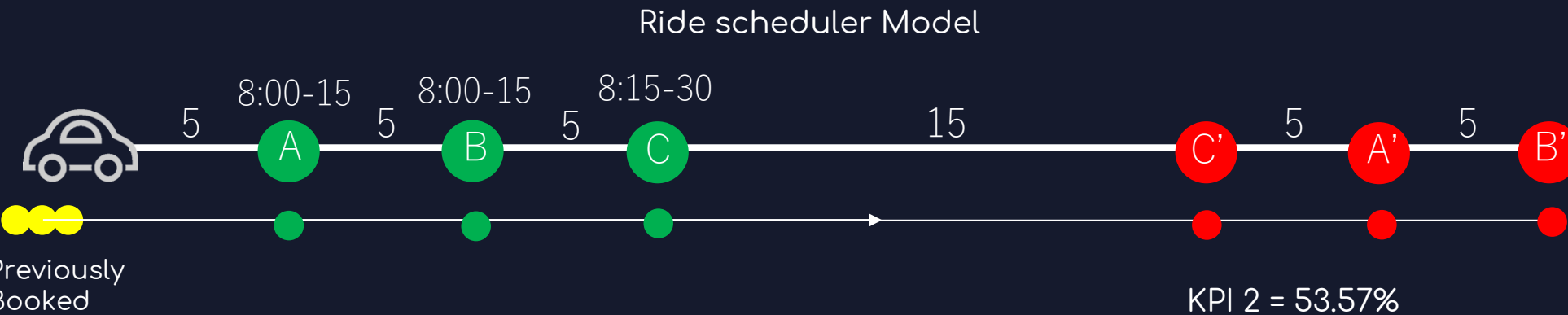
1. $(\text{Pool journey Time per user} - \text{UBER X/Go Journey time}) / (\text{Pool journey Time per user})$ [Time Parameter]
2. $(\sum ((\text{No of People in cab} / \text{Maximum Capacity}) * \text{Amount of time}) / \sum (\text{Amount of Time})) * 100\%$ [Efficiency Parameter]



Consider a one-dimensional example to highlight advantage. There is a car 5 mins away from A. The times of booking and the distances in minutes are known. Also assume a 2 min pick time for secondary riders.



	WT	JT	KPI 1
A	5	54	0.44
B	5	42	0.28
C	5	15	0



	JT	KPI 1
A	34	0.12
B	32	0.0625
C	15	0

There is a significant improvement in Time Parameter from Proposed Pool. There is less significant increase in efficiency parameter which may be attributed to lack of cancellations. The above example proves that there are significant improvements to KPIs by using UBER Ride scheduler, hence we should proceed with the same

Business Case

Who is our target customer?

People who use Cab aggregator services for regular & consistent rides.

Those who need to stick to a schedule.

They are:

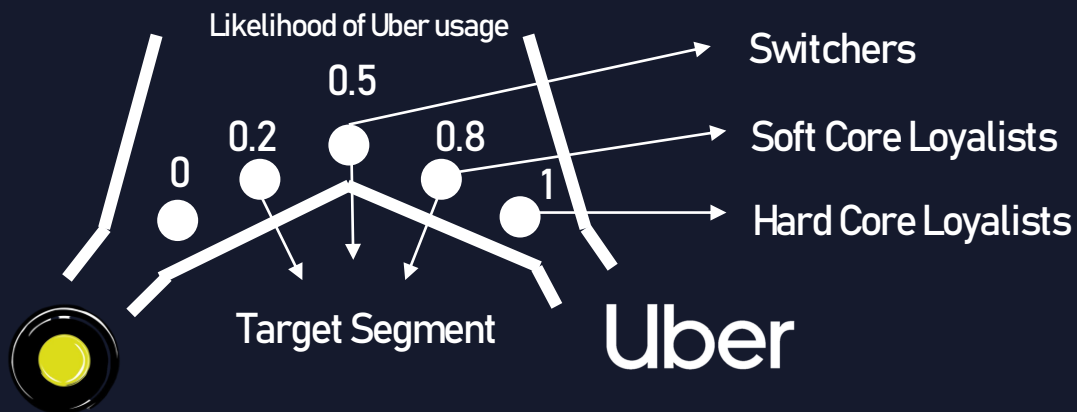


Corporate Employees



College Students

The customer loyalty funnel : Double funnel



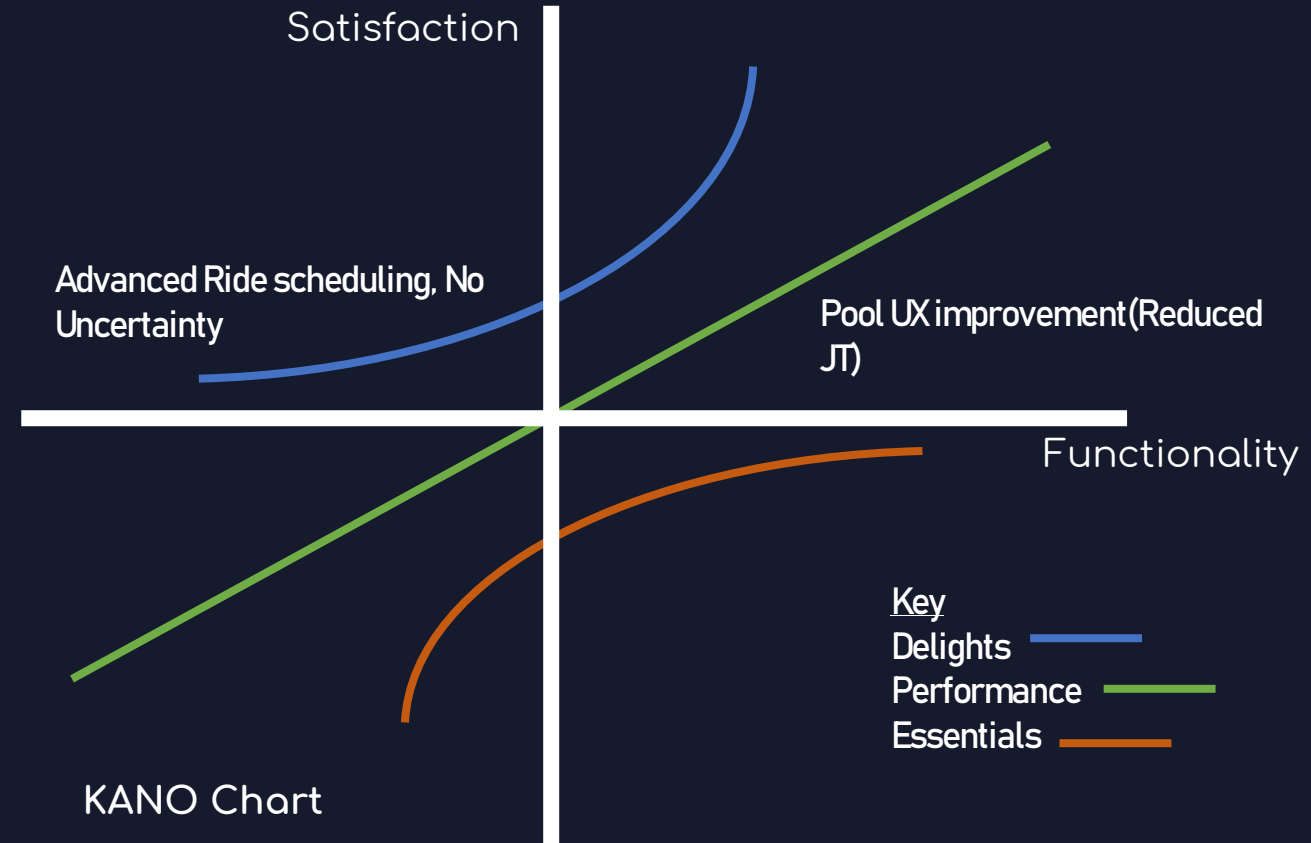
INCREASE IN CUSTOMER LOYALTY (KPI : No of rides/day for a user)
Once scheduled, there is a much lesser chance for user to switch to Ola. This will induce the target segment to migrate towards Uber.

How will Uber Regular improve customer satisfaction?

INCREASE IN CUSTOMER SATISFACTION

KPIs:

1. Ride Rating
2. %age Pool Usage

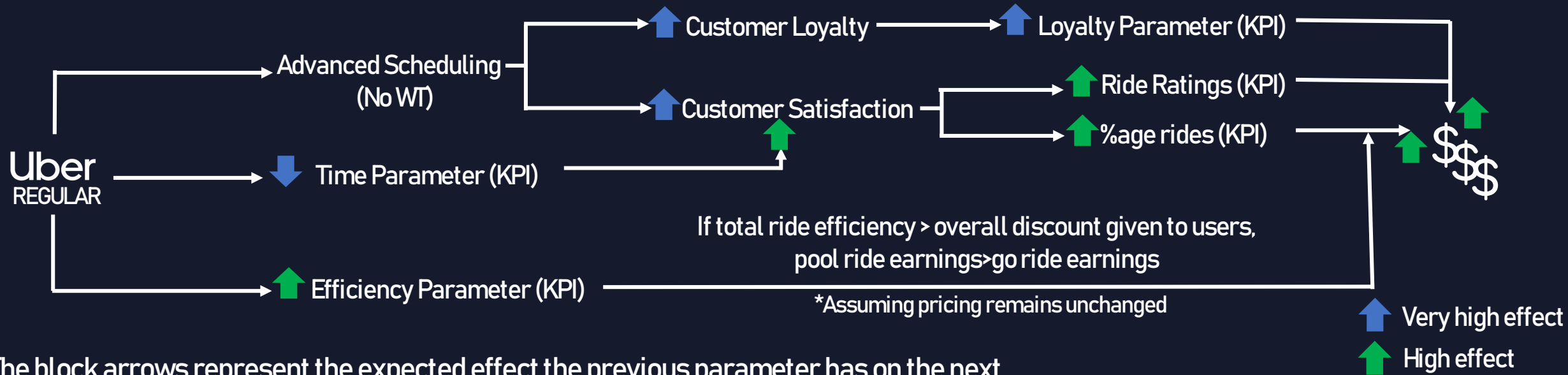


Established that there will be an increase in customer loyalty & satisfaction.

Business Case

Uber

Parameter Dependence Chart



The block arrows represent the expected effect the previous parameter has on the next.

The next step should be to deduce the exact relationship between given parameters so that impact may be estimated.

Why should the feature be limited to Pool?

This solution was arrived at by doing a root cause analysis of problems in UBER Pool. However, looking at the above chart, Advanced Scheduling is a feature which does provide gains in scenarios without UBER Pool as well. Hence, it should be eventually extended to other services like Uber Go, Uber X etc. However, It should first be implemented for Pool because a combined launch may hurt the growth of Pool.



Potential Pitfalls & Questions



The Domino Effect

One of the biggest risks is the Domino effect. If anything goes wrong at the start of the route, it will have a magnifying effect on the whole perpetual ride.



How does Uber Schedule currently work?
Present Uber schedule is but an automated system which starts looking for rides during the time slot. Uber doesn't use the concrete data point for the purposes being used here.

LATE

Driver arrives late

One of the biggest potential pitfalls is a Driver arriving later than specified by the app. This may be due to genuine reasons or spurious ones. Specifically for a country like India, this may be a pervasive problem due to peoples' attitudes and forecast defying traffic.

CANCELLED

How will Uber regular handle cancellations?

User Cancellation: User cancellation will have the same rules as that of normal cancellations. The route including that user will be recalculated. User cancellation can be deterred by cancellation fee. Preponement option won't be available.

User Postpone: User postponement can be done by cancellation & addition of ride to available future slot.

Driver cancellation: More serious problem which might cause a domino effect. This can be deterred by hefty cancellation fees. If cancelled, normal drivers around the next pickup point can be assigned, similar to how current schedule works.



Driver adoption

Drivers prefer to be flexible with their timings. On Uber Ride scheduler, they will be instructed to be at pickup location on time. There may be some friction from them for adopting this. However, ride scheduling will also be a draw for drivers since it will provide them:

1. Perpetual rides
2. Elimination of long circuitous routes from Pool



When will the optimisation occur?

The time between the pickup & when optimisation occurs depends on 2 factors:

1. Time taken for optimisation.
2. Time after which there are minimal cancellations/modifications.

What is the problem?

The problem is bad User experience in case of Uber Pool rides. This includes long journey & waiting times as well as psychological pin points. The Problem as well as the root cause methodology of the problem have been addressed in **Slides 2&3**.

How did I use technology to solve that problem?

A number of route optimisation algorithms already exist. Maps API can predict future traffic data. The only missing chunk was rider data, which is now provided by the Scheduler.

Potential Solutions

For solving the root cause, two solutions were proposed i.e. Demand Forecasting & Uber Scheduler. The solutions are addressed on **Slide 4**.

Comparisons

The algorithmic benefits for solution 2 were proved in **Slide 5** for a simpler one dimensional case. Solution 2 was deemed superior. The business case was discussed subsequently in **Slides 6 & 7**.

KPIs

A total of 5 KPIs have been mentioned in **Slides 5 & 6**. They are: Time Parameter, Efficiency Parameter, Loyalty Parameter, Ride Ratings & %age Users. Their relationships have been consolidated on **Slide 7**.

Pitfalls

The bigger risk here is that of a Domino effect while ride sharing. The pitfalls & questions which may arise have been addressed in **Slide 8**.