TEAM 2: UBER CASE REPORT

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1. What are the potential pain points of the pickup experience for the different customer personas? Use the persona information in the case, the narrative in Exhibit 5, and your personal experience to identify pain points for each of the rider personas, as well as for the driver.

Let's talk about the potential pain points of the pickup experience for each customer persona that has been identified in the case:

1. Premium: This user group is the most willing to pay for receiving the highest quality service for their ride. What matters to them is a personalized experience. A premium user will always expect their Uber to arrive at the pickup place before them. So, in this case, the greatest possible pain point for a premium rider is waiting for the car to arrive after they have already arrived at their pickup location. Another annoyance for a premium user would be if they continue to arrive at the pickup location at their leisure and the driver calls them to inquire about their location.
2. High-Frequency Riders(HFR): This user group consists of people who travel often during the day and may take many rides in a single day. This category includes those who live in metropolitan areas with a lot of traffic and need short rides. These customers prefer to purchase a pass so that they can ride for less money and get paired with a driver more quickly. In relation to this, a potential issue for these consumers could be that when they use the app to book a ride using their pass, the app simply does not give them a discount, and the price that the app displays is the same as if the rider had not taken a pass.They may expect prompt service because they use the app so frequently. In this case, if they are waiting for a driver who then cancels, and they are then matched with another driver who will arrive after a large length of time, this will be a major source of frustration for them.
3. Commuters: Users who take Uber instead of public transit to work are primarily included in this group. These users would expect a smooth experience when returning home after a long day at work. When it comes to this expectation, one source of frustration for them is discovering, on their way home after a long day at work, that the uber driver has been misled and is not standing at the usual pickup location. Instead, the car is parked across the street, and they must walk to get to it. They can't afford to be late to work if they take an uber to work. In this circumstance, if the uber rider arrives later than predicted, the user will be greatly disappointed.
4. Social: This group includes Uber riders who utilize the service to get to events and who typically ride late at night or on weekends.One of the worst pick-up experiences for a member of this group is arriving at the pick-up place late at night just to discover that the driver isn't there, and on top of that, they are unable to call the driver for whatever reason. Another issue to add to this is if the program simply stops showing the driver's pin and there is no information available that tells the rider where the driver is. One common annoyance is that after booking a ride at a specific price, the ride is mysteriously canceled (might be due to some technical problem in the application or at the driver's end), and when rebooking the ride, the price displayed in the application is hiked.

5. Travelers: This group of people typically uses Uber as a stopover on their long travel. This could include going to the train station or the airport. These users may experience a pain point if they have traveled to a new area for any reason and are waiting for an Uber driver at a pickup spot they have designated. They are unfamiliar with the area, so if the car does not arrive at the correct location, they will have a difficult time finding the site where the ride is waiting. Because they have little knowledge of the neighborhood, getting to the place will be difficult. Another annoyance is that the driver refuses to assist them in loading or unloading their luggage, which may be alot. Even worse, they may discover that the car's boot space is already occupied with other items or a gas cylinder, forcing them to either cancel the trip and book a larger vehicle or keep their luggage with them.

   When viewed from the driver's perspective, one of the most aggravating parts is when the rider fails to show up although the driver has waited for them at the stated pick-up site. The rider then refuses to pick up their calls when they do, and when they do after many efforts, the rider is rather rude to them. Another issue that a driver encounters is that riders frequently cancel rides for various reasons, which may be a very unpleasant experience if the driver has traveled through severe traffic to reach the pick-up location.

2. Define the ideal pickup experience for each of the rider personas, as well as the driver persona. Use the information provided in the case regarding the priorities and expectations of individual personas to define an ideal pickup experience for each one. Create a short description of the ideal experience, as well as a list of two or three outcome expectations for each persona.

Let’s consider the ideal pickup experience for each rider persona

1. Premium: For a premium user, the ideal pickup experience would be for the driver to arrive at the perfect location without bothering them after they book an Uber. The rider then receives a courteous message from the driver informing them that they have arrived and that they can take their time getting to the pick-up place. When they come to the car, the driver greets them professionally.

   Outcome expectations:

   A. Personalized experience wherein special requirements are met.
   B. Services such as assistance by the driver for luggage loading and unloading.
   C. The driver may ask them if they need assistance about the city if they do not belong here.

2. High Frequency Riders (HFR): For frequent riders, the ideal pickup experience would be to receive an appropriate discount when booking a ride in the app. The nearest driver to the area is then assigned, and the ride is not canceled. The driver assigned to their ride is experienced enough to navigate through traffic in the most efficient manner possible and arrive on time.

   Outcome expectations:

   A. Cheapest price point for every ride with lowest waiting time of arrival.
   B. Frequent discount codes and rewards so that they can ride more.

C. An option to repeat the last ride.

3. Commuters: For this user group the ideal experience that could have is that the driver reaches the exact location and does not cause any delay due to wrong directions since they can't afford to be late to work. If they are then taking a shared ride, they are matched with riders so that they won't have to travel a long time which can cause time delays to them. In addition, Uber can carry out analysis and if they regularly see the pickup location has been input incorrectly by the user, they may train a model to update this on the go.

   Outcome expectations:

   A. No delay in the arrival of the driver to the pickup location.
   B. Hassle free experience wherein the driver is at the right location so that they.
   C. Don't have to walk much after a long day's work.
   D. Some form of peaceful entertainment after a long day's work.

4. Social: For a user in this group, an ideal case scenario would be that when they try to schedule a ride late at night, the driver does not cancel on them and that they can be in constant communication with the driver regarding the status of the trip. After that, the driver arrives at the correct location and is willing to wait without complaining for some time.

   Outcome Expectations:

   A. Efficient communication with the driver if need be.
   B. Feel safe around the driver when it's late.
   C. Driver escorts the rider safely to the door of their apartment / building if asked by the rider.

5. Travelers: An ideal experience for this user profile would be that after booking a ride, the driver comes promptly to the pickup place that they have pinned. When the driver arrives at the pickup location, he or she is willing to wait if they are having difficulty getting to the pickup spot because they are unfamiliar with the area. Furthermore, the driver assists them with their luggage, supporting them in loading and unloading the luggage after the ride is completed.

   Outcome Expectations:

   A. Proactive and empathetic driver who is willing to go out of their way to help.
   B. No mistake by the driver in reaching the exact location.
   C. Driver is well acquainted with the local life and has suggestions to make to the rider.

From the driver's perspective, the best-case scenario is that the rider selects the pickup place correctly the first time. The GPS then provides the shortest distance feasible with the least amount of traffic congestion so that the driver may arrive at the pickup place in the lowest amount of time. Once they arrive at the pick-up site, the rider does not keep them waiting for long. If the driver phones to inquire about the rider's whereabouts, they speak with them politely and arrive at the pickup point as soon as feasible. After arrival, the rider is kind enough to inquire about their needs so that the driver can assist them as efficiently as possible.

Outcome Expectations:

A. Empathetic rider who coordinates well in case there is some technical problem faced.
B. Minimum waiting time once they reach the pick up point so that their time isn't wasted.
C. No cancellation done from the rider's end.

3. Develop a list of hypotheses Uber could use to predict a rider's pickup location with information such as the rider's previous trips and current destination, as well as historical patterns related to the pickup location. Augment the case information with your personal Uber experiences to suggest potential hypotheses.

- Consider a scenario where a rider saves their home and/or office addresses. When they book a ride from their home/office, common pick up points can be suggested. Me, being an avid Uber rider, had these addresses saved when I used to stay in India. The app suggested the same pick-up point every time I booked a ride from my house, which was right outside the main gate of my society.
- Pick-up points can be suggested based on the destination. Say for instance, the destination is a residential area and the current location is an office building. Common exit points of the building can be recommended as pick-up point such as Exit 1, Exit 2 and so on. This hypothesis stems from a personal experience when I used to book an Uber back home from my office complex in India. The app would suggest three pick-up points for me, same as the number of exit gates within the office complex, where most cabs would arrive.
- These two hypotheses support the need to provide multiple options for pick-up points in the same vicinity. Beyond offices and residential areas, this principle can be applied to a myriad of locations appealing to each persona mentioned in the case study. Multiple points of entry to a hotel can be suggested as pick-up points for premium riders who are residing there for a business trip. For travelers, an airport can have multiple terminals that may serve as different pick-up points. Designated cab areas such as Uber-Zone introduced in Bangalore and Pune (India) outside airports also support this scenario. For social riders, common points of access to the restaurant, club, concert (or any other event) venue can serve as pick-up points such as the entrance, the exit and the parking lot. This will minimize the ambiguity and issue of uber recognizing riders' pick-up points. In cases, when a social rider is intoxicated, these will prove especially beneficial as the rider will prefer not to spend mental effort in choosing a location if the pick-up point suggestion is made efficiently – This reinforces the safety factor, as if done correctly, riders will feel comfortable taking an Uber after say a night of drinking.
- In the case of Uber Express Pool, the case study suggests that commuters may select an area to wait instead of a spot. A frequently preferred area can be suggested to a rider making a booking from that vicinity for the first time.
- Consider a rider who has taken the same trip before and a positive experience (through ratings and feedback) was reported by both the rider and driver. In this case, the same pick up and drop locations can be suggested to the rider for the next time. I would find this feature useful for visiting my favorite cafe from my house, since I make a weekly visit.
- Pick-up point accessibility can be improved based on the rider's current location. Integration with google maps can be made to infer if the user's current location falls in say, a construction zone where vehicles aren't allowed, Uber can inform the rider while also suggesting the closest alternative pick-up spot. This may include common

landmarks such as a bus stop, retail store entrance etc.

4. Create a quantitative pickup quality metric using attributes derived from the passive, active, and third-party signals available to Uber. Discuss why your selected attributes represent a robust pickup quality metric. What weights would you assign to the features you chose for your pickup model?

The quantitative pickup metrics we chose would encompass a generalized user experience from the moment the rider decides to take a ride with Uber, that is, opens Uber application and to the moment the rider is picked up. We use a combination of passive signals and active signals to define the metric to improve the pickup experience.
We have selected four attributes to represent a robust pickup quality metric:

1. Number of user taps on the application before placing a ride-booking request: When the rider opens the application on their smartphone, the number of taps on the application indicates whether the user's pickup location was correctly anchored. A Smaller number of taps would indicate that the user is in an area where the accuracy of GPS signals is high whereas a high number of user taps would indicate that the user is in a region with less GPS signal accuracy. Accordingly, this helps the Uber operators to locate areas where optimization of location anchoring is needed.
2. Difference between ETA and ATA: The time difference between ETA and ATA would help identify third-party factors resulting in the delay of the pickup. This attribute would help identify congestion or road closures, diversions, etc. along the pickup point. Additionally, a significant difference between the ETA and ATA would also help optimize the route suggestions for pickup.
3. The distance to the rendezvous point by both rider and driver: The total distance traveled by both the rider and the driver to reach the rendezvous aids in determining the pickup point's accuracy. The distance travelled by drivers while circling around the rendezvous site could equal the entire distance covered by them. The rider's distance is the distance walked from their starting point to the rendezvous spot. These distances, when added together, aid in the selection of a meeting location at the time of booking. If the rider needed more distance, he or she might request it.
4. Rider/Driver contact rate: If the location is in an area where the GPS signal is weak or if it is a congested site like an airport with a large number of riders and drivers creating confusion, the contact rate between rider and driver could be an indication.

Our weight guess for a robust pickup quality metric is defined as follows:
Pickup happiness = Minimize [(25% * time difference between ETA and ATA) +
(25% * # of taps before placing request) +
(25% * distance to rendezvous) +
(25% * Rider/Driver contact rate)

5. *Based on your pickup quality metric,* what actions can Uber operators take to improve the pickup experience?

1. Difference between ETA and ATA
This would be necessary mostly when there is high traffic on the roads and GPS is unable to keep up with the changes. As previously indicated, one solution would be to keep the rider

informed by creating the appropriate expectation. Allowing a one-tap message send option to the driver to inform the rider that he may take the same amount of time (if GPS is not updating but the driver is nearby) or additional time could be one solution (given the traffic condition). Another option would be a feature for both the rider and driver to suggest to each other an alternative location within a few meters that would help reduce commute time for either party.

2. Number of user taps on the application before placing a ride-booking request

UX teams play an important part in this. One option is to provide the rider with a one-tap "repeat ride" option. Regular commuters, as well as those flying overseas for conferences and needing to travel to the same location every day, would find this incredibly beneficial. Try again currently needs the user to re-select the destination and modal.

Enhancing the recent destinations option is another option. Currently, selecting one of the previously ridden destinations requires two taps. Instead, a list of quick destinations might be found at the bottom of the home page.

3. The distance to the rendezvous point by both rider and driver

This circles back to the problem this case is trying to solve – that of removing pick-up point ambiguity.

We can look at other options like providing incentives to the user: free walking meditation / walking music

Users may be asked to input the name of a famous store nearby which would help the driver to find the rendezvous point easily or may be used by Uber to direct the driver correctly.

Users could also be asked to click a picture of the rendezvous point and upload for the driver to identify if he is at the right pickup location

4. Rider/driver contact rate

Come up with a way in which riders can choose which side of the road they are on by improving uber maps. This may be achieved by adding an additional optional button for the rider to choose especially when their anchor location has low confidence.

6. How would you improve the pickup experience at venues such as sporting events and concerts, which typically see temporary surges in demand for Uber rides, as well as temporary parking restrictions and traffic congestion?

We see there are several scenarios related to pickup experience at crowded places. Some ways to improve pickup experience during temporary surges in demand would be:

1. Targeting the problem of customers not being able to find their associated cars from among the long lines of Uber cars: we can provide cards with number plates in a large font to the drivers for them to place on top of their cars while waiting in the temporary parking lot waiting for customers. This would help the customers find their assigned cars easily, reduce possibility of error and increase the speed of pickup.
2. Solving the problem of temporary parking restrictions during surges in demand: As Uber already collects location information of the user, they can try to detect if the customer has gotten off in the area of a stadium / theater, etc. and right after their drop off, Uber can send them a push notification asking them to pre-book their ride back home. As a result, Uber can approximate the number of requests in that area and try to send as many drivers as possible well before time to reduce the wait time for pickup. They could also add incentives to prebooking like free of cost rescheduling, bonus points for pre-scheduling, etc. This would help the rider find a ride beforehand, and reduce the

wait time as they would have booked a ride right when they would step out of the stadium.

3. Traffic Congestion: One way in which Uber can try to resolve this issue is, Uber can easily understand if the GPS location of the driver has a low confidence especially in areas of high congestion. As a result, the driver's location seems to be stagnant at a particular location due to which the user might get annoyed and cancel her ride. Uber can send a prompt to the driver asking him if he wants to send a quick message to the rider about their status. One of the two options can be provided: "Hey! I am nearby, kindly wait for me. ETA is less than five minutes." or "Hey! I am stuck at a location and it would take more than five minutes to reach your location. Congestion is high and if you cancel this ride and rebook, you would probably take longer to find a ride." In this manner, the rider is informed of her options and may help calm her down too as it would shift the focus to the congestion in her area instead of becoming furious about the app not working.

7. Discuss the steps involved in setting up an ML model for automating pickups at scale. Use the framework of the seven-step model in the case (Exhibit 7) to elaborate on how Uber should apply this framework to the ML model. *Hint: You can create a table and list the tasks under each step.*
    1. Define the Business Problem:
        a. First step involves digging deep into the problem statement. The five-why's method from "Are You Solving The Right Problem?" would be helpful here. Digging deep to understand if the problem we are trying to solve is going to help us achieve our goals or do we need to pivot to a new problem statement.
        b. Uber has been trying to improve the pickup experience. Given the set of challenges they face - cultural differences, modalities and rider expectations, it seems like their goals are varied and this would require them to set and prioritize hypotheses.

    2. Assess if ML is Appropriate
        a. This is an essential step. After understanding the business problem, one needs to gauge if the problem can be resolved using other, simpler methods or otherwise. Choosing an ML model would depend heavily on the quality of data. Further so, real time decisions would require a robust self learning model with reduced error rate.
        b. Uber has a range of hypotheses to target. Not all of them would need ML algorithms to solve. Firstly, using an ML algorithm is too expensive in terms of time and effort. Secondly, it might not help get the right output, it would overcomplicate the data.
    3. Gather and Label the Data
        a. This step involves finding the most suitable sources of data such that most of the data is useful. One needs to consider the time and effort required to correct the data - fill in missing values, corrupt data, etc. Right data would also mean that we use features which are relevant to find the output we are aiming for. Collecting huge amounts of correlated values, for example, would render most of the data useless.
        b. Uber could collect data from a range of different options. They had the option to gather feedback from the customers, some inferential data like rider wait time, cancellations, if they had to call the driver for instructions, etc. Apart from this,

they could also join hands with the Government bodies to keep a track of traffic information, roads, etc.

4. Preprocess the data
    a. Garbage In, Garbage Out: The data collected in aforementioned stages would need to be cleaned. Data Engineers look at the quality of data and assess different methods that can be used. In addition to this, one also needs to understand which would be the right model to clean this data. This renders this stage essential as if the data input to the later stages would release the output.
    b. Cleaning of data, although it has several set-methods, this step is specific to the type of data collected and the relationship between them. Uber had to analyze the data to appropriately preprocess it.
5. Engineer features
    a. One needs to make sure that the data scientist would use the appropriate set of features to avoid overfit and underfit. Making sure that correlated features are avoided and only those features that yield maximum relevant output are selected. One might think of many features that might give us the output, however not all of them might be useful.
    b. Uber had to carefully design their features, understanding correct correlation between the input and output variables.
6. Choose ML approach and Algorithm
    a. The data generating algorithm is usually unknown to humans. However, there is to estimate the function closest to this data generating algorithm by hypothesizing an ML algorithm and optimizing the final hypothesis. This is the actual ML step where we learn the outputs from the inputs (either through Supervised or Unsupervised learning). We then train the model to generalize beyond the training set. Regularization is an essential step here to avoid overfitting.
    b. Uber must decide whether a mix of these methods is required and, if so, which one will be employed for which set of hypotheses to be investigated in the final phase of a successful ML algorithm.
7. Make UX decisions
    a. All of this output must be put to good use. It must be communicated to the user in a form that they can understand. All of the features we recommended for providing the best user experience are only achievable if the UX team sends the proper data to the customers.
    b. Uber's user interface has been updated on a regular basis to improve the user's experience. There were substantial UX changes, particularly when they switched from a pickup-first to a destination-first paradigm, which completely transformed the user experience. Everything else would be for nothing if this phase was not taken seriously, resulting in a clean, intuitive interface.