Uber Supply –Demand Gap

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Summary

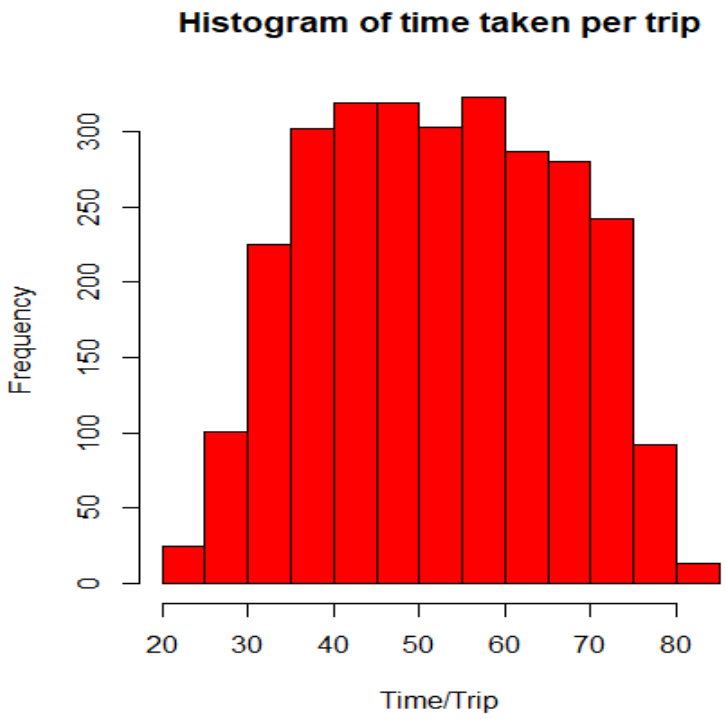
The analysis suggests that most of the cancellations happen in morning hours going from City to Airport and the situation reverses in end of the day when there is shortage of cabs to come from Airport to city. Following steps were followed to identify recommendations:

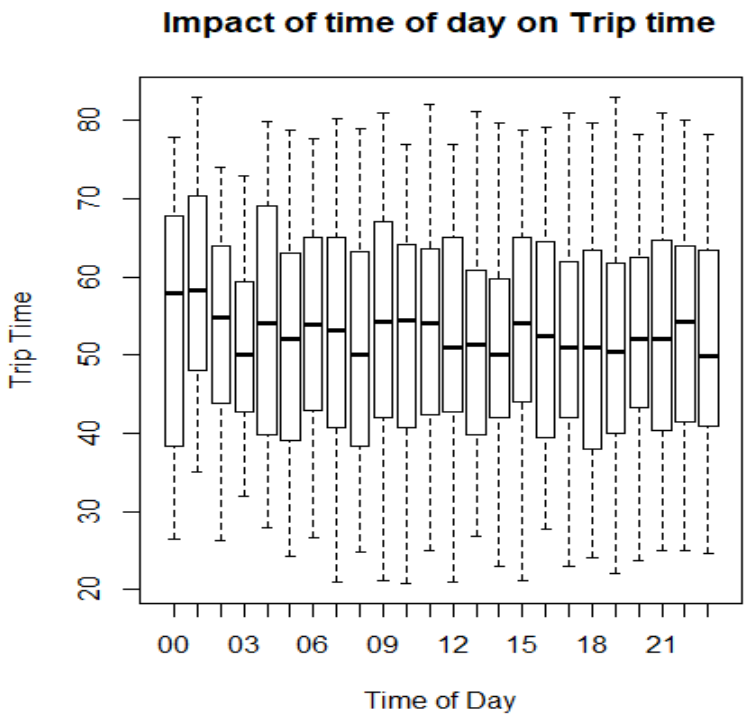
1. Data download and cleaning
2. Understand the data better with uni-variate analysis
3. Identification of problem
4. Calculation of Demand supply gap and plausible reasons for the same
5. Solution recommendation

Data download, cleaning and understanding

- CSV file “Uber Request Data” to create a data frame “uber”
- 58% of values for Drop.timestamp are NAs
- 39% of Driver ids are NA
- Format for two columns-Request.timestamp and Drop.timestamp is not consistent. So following steps were followed:
  - Use lubridate package to make format consistent
  - Convert columns into standard POSIXct format
  - Derive new columns for year, month, day, hour and week
- Results of univariate and segmented analysis
  - All data is for July 2016. So seasonality can’t be ascertained
  - Most trips take 40 to 60 minutes. But little variation in time/trip during time of day
  - All weekdays get almost similar number of requests. Status of requests don’t tend to vary too much according to weekday
  - Peak periods are mornings (5 to 9AM) and evenings (5 to 9PM)

Results of univariate and segmented analysis-plots





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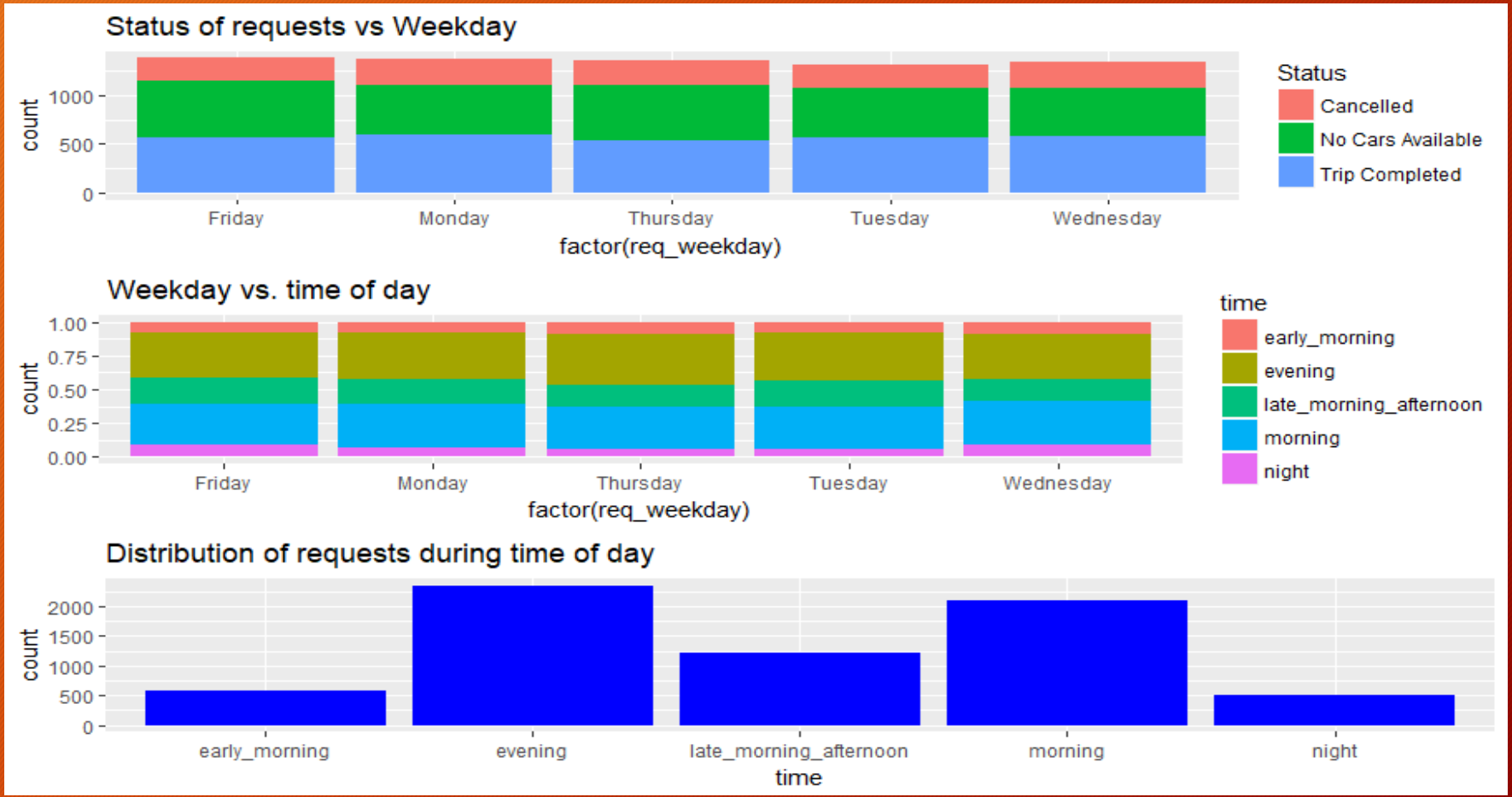
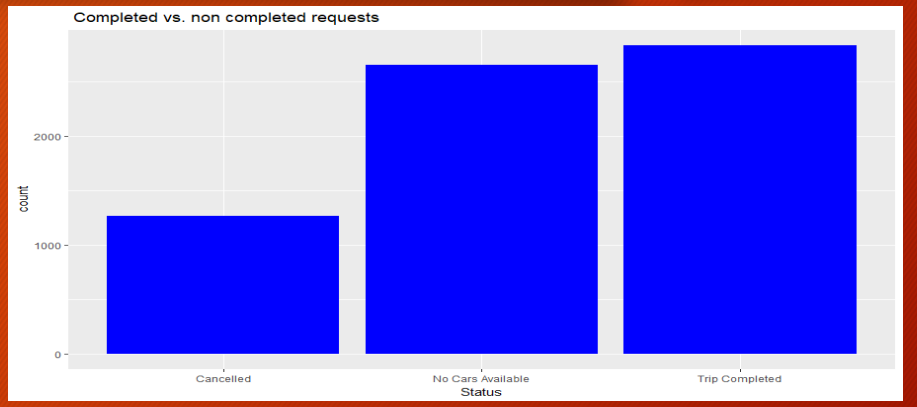


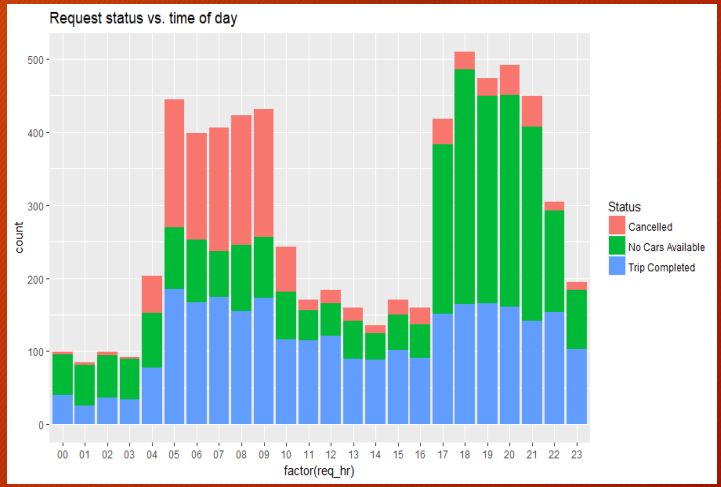
Problem identification

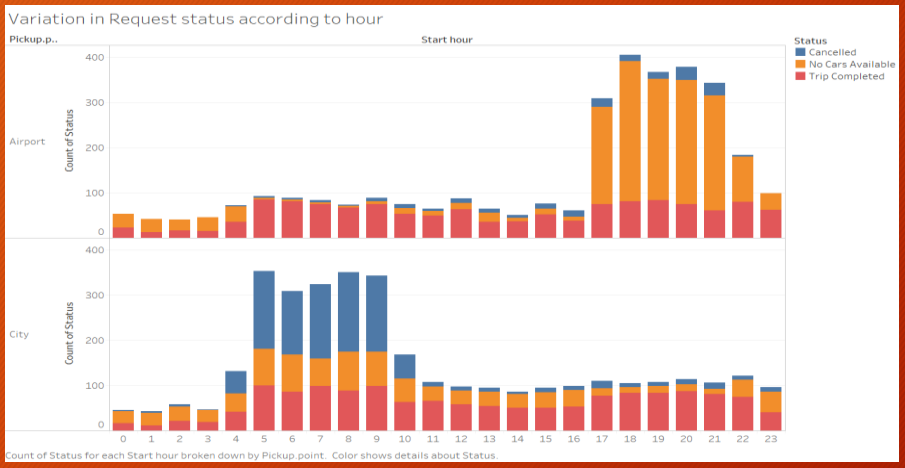
- 58% of requests are not completing. Either cancelled or cabs are not available
- Trips from Airport to city have problem of inadequate number of cabs. While trips from city to Airport witness large number of cancellations

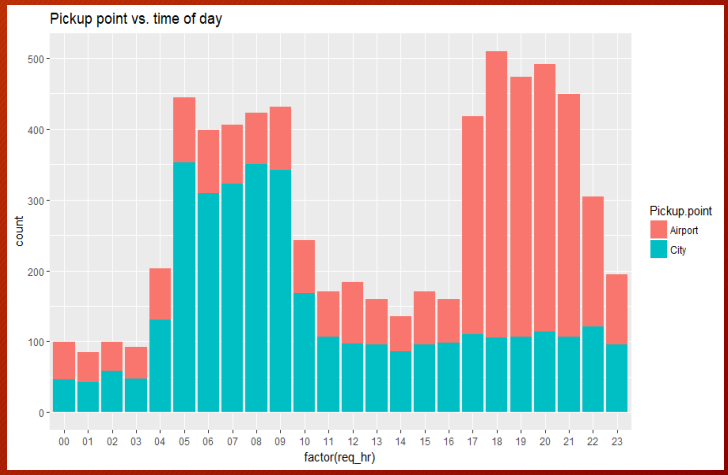


Problem identification…..

- Cancellation of requests is problem in mornings while shortage of cabs is concern during later in the day
- Trips from City to Airport dominate in mornings hours. This reverses later in the day
- Key takeaway: Trips from City to Airport dominate in morning and have problem of cancellation. In Evening trips from Airport to City dominate and witness shortage of cabs

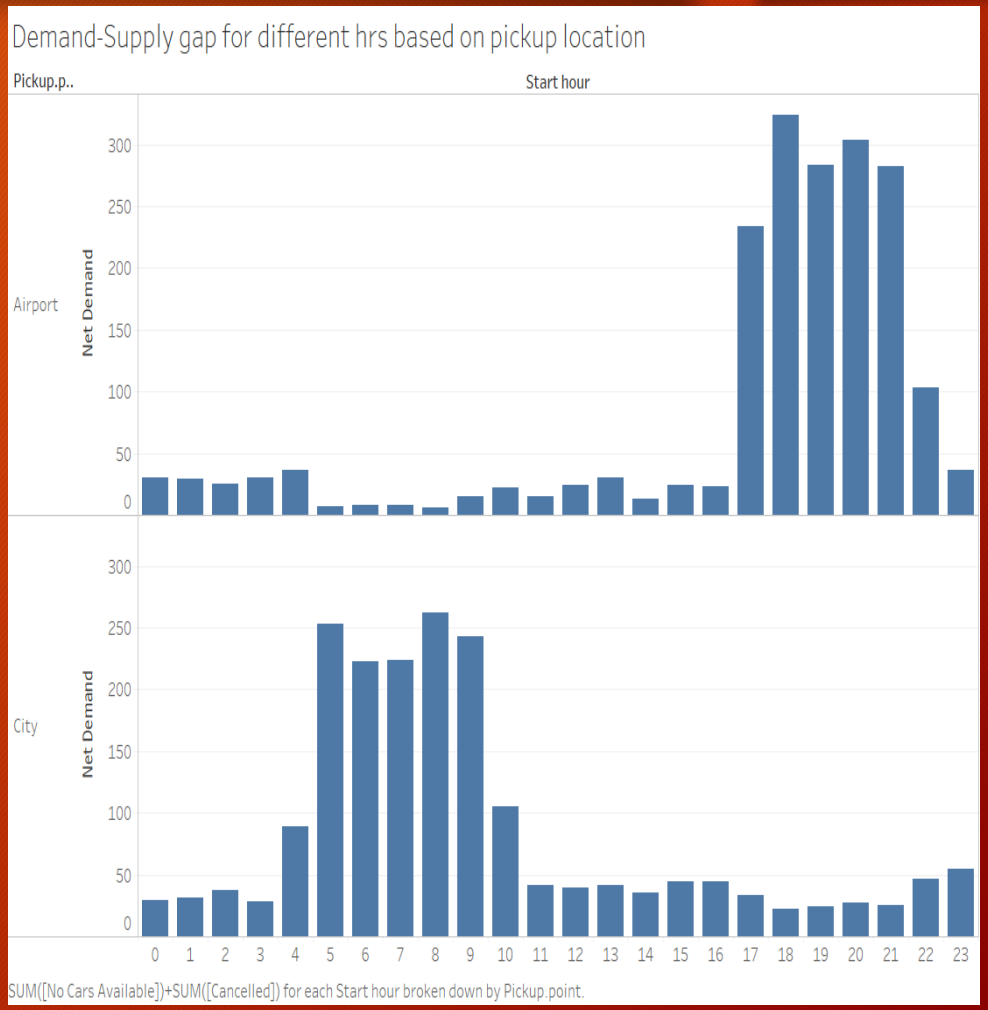






Demand-supply mismatch

- Demand=Trip cancelled + trips for which cabs were not available+ trips completed
- Supply=Trips completed
- So Demand-supply gap for an hour=sum of trips cancelled + sum of trips where cabs were not available
- Trips from Airport in later part of day (5 to 9 PM) have access demand. And trips from City in early hours (5 to 9 AM) have also have access demand…though reason for excess demand in both the cases could be different



Plausible reasons for mismatch in demand and supply

- Trips from City to Airport in morning hours (5 to 9AM):Not many incoming flights in morning which means lower chance of round trip for driver partner. This in turn makes a trip to Airport less profitable for drivers.
- Trips from Airport to City during 5 to 9PM: Incoming flights are concentrated in evenings (may by because of International flights) which increases demand in evening

Recommended solution

- Access demand in evening can be managed by
  - Surge pricing to attract more cabs
  - Run buses (Uber bus) from Airport to some key locations in city in evening
- Access demand in morning can be managed by
  - Surge pricing or reduce Uber's commission in morning to make single trips to Airport (in morning) economically viable for driver partners
  - If a trips get's cancelled suggest options of shared trip to customers. More number of passenger/trip could make the trip economically viable for driver partner
  - Run buses (Uber bus) to Airport from some key locations in city in morning