

Analysis of Airbnb's in Rio de Janeiro

Armando Arevalo

Why Airbnb?

- Study **real-world data**
- Interpretability , not obscure or hard to understand
- Good for practicing analysis methods
- Interesting and fun

Goals for Analysis

1. **Propose possible key metrics** to monitor over time the success of improving the guest-host matching process?
2. **Define areas to invest in** to increase number of successful bookings? What segments are doing well and what could be improved?
3. **Propose business initiatives and product changes** that could address these areas. Explain rationale behind each recommendation and prioritize recommendations in order of estimated impact.
4. **What other research, experiments, or approaches** could help the company get more clarity on the problem?
5. **Share interesting insights** found in analysis

What Metrics Can We Use

Possible Metrics

- Listing average seasonal booking time
- Host seasonal booking average
- Listing newcomer & guest return rate
- Listing review rate

Listing average seasonal booking time

- Simple way to track **how long guests take to book a given listing**
- Visualize quickly-booked listings versus slowly-booked listings (e.g. quickly reserving a listing or shopping around before booking)
- Calculate booking time (see below) for each successful inquiry, then average this value for each listing at each season of year (i.e. spring, summer, autumn, winter)
 - **Booking time** = the **time duration** an inquiry takes to succeed or complete booking (i.e. time of booking minus time of inquiry)
 - Note: (1) “instant book” has booking time of zero and (2) since traveling fluctuates by season it's more appropriate average at each season

average(time of booking – time of inquiry) per listing per season

Host seasonal booking average

- Gives a **scoring on how successful a given host is** and would allow the tracking of successful/unsuccessful hosts
- Calculate by dividing count of successful bookings by count of all inquiries, then average these by each host at each season of year

$$average\left(\frac{\text{successful bookings}}{\text{all inquiries}}\right) \text{ per host per season}$$

Listing newcomer & guest return rate

- **Newcomer rate**
- Helps quantify how many new guests a listing attracts
- Calculated as new bookers divided by all bookers per listing

$$\left(\frac{\text{new bookers}}{\text{new \& past bookers}} \right) \text{ per listing}$$

- **Guest return rate**
- Helps quantify how many pasts guests return to a listing
- Calculated as past bookers divided by all bookers per listing

$$\left(\frac{\text{past bookers}}{\text{new \& past bookers}} \right) \text{ per listing}$$

Listing review rate

- Quantifies **how “reviewed” a listing is**
- Can highlight good or bad listings, since not all reviews are necessarily positive
- Calculated as number of reviews divided by number of bookings per listing

$$\left(\frac{\# \text{ of total reviews}}{\# \text{ of total bookings}} \right) \text{ per listing}$$

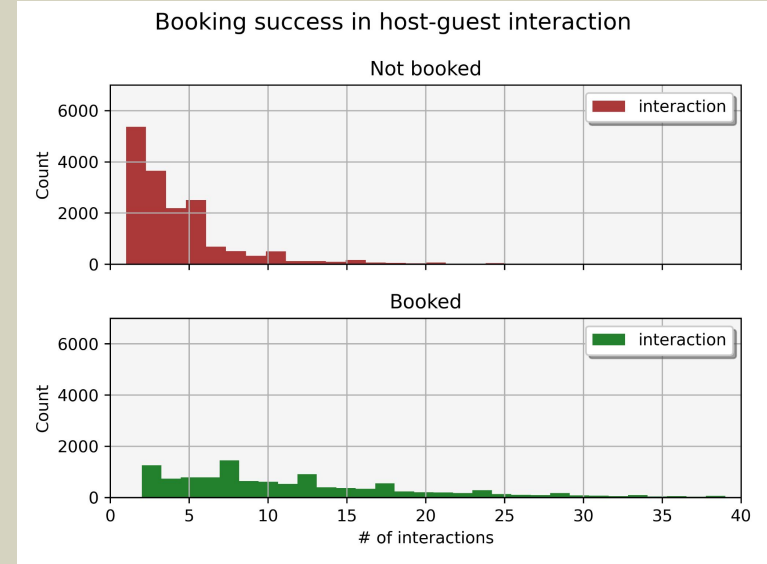
What Areas Can We Invest In

Improving Successful Bookings

- **Motivate guest-host interaction**
- **Promote reviews for listings**
- **Suggest timely hosts in search**

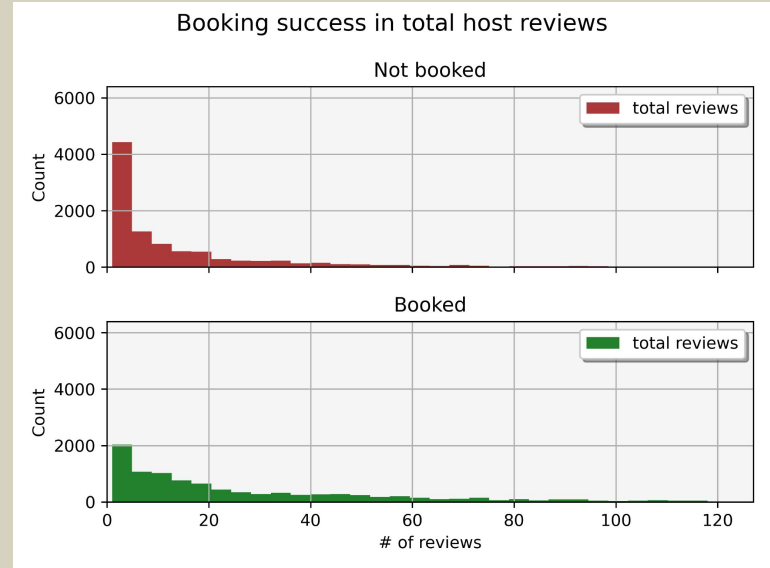
Motivate guest-host interaction

- **Guests who interact more** with hosts book more often
- Guests with fewer than 7 interactions tend towards not booking
- *Lead guests to message host by **suggesting potential questions** one could ask regarding a listing



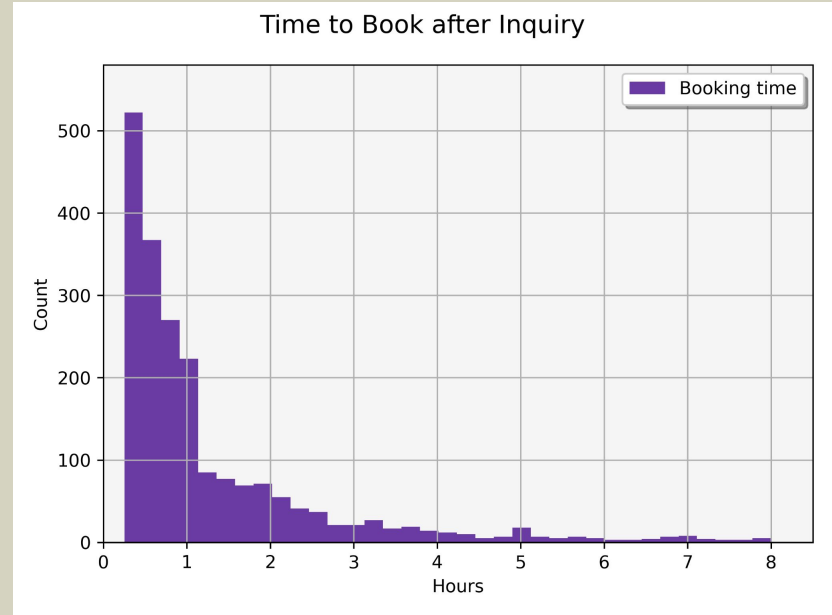
Promote reviews for listings

- **Listings with more reviews** tend to be booked more often
- Reviews can work both ways
 - **Positive** reviews can **attract** guests
 - **Negative** reviews can **deter** guests
- *App could **offer few-dollar coupons** for next booking to leave a review
 - Can promote good listings
 - Can weed out others that are unattractive/have defects



Suggest timely hosts in search

- Most bookings take place **within the first 2 hours** after inquiry
- *During listing search app can **prioritize hosts that respond within half hour**



Business initiatives to follow

1. **Listing search feature should prioritize hosts** that respond within half hour
 - a. Majority of bookings occur within the first 2 hours inquiry is made
2. **Promote guest-host interaction by suggesting potential questions** guests could ask regarding a listing
 - a. More interactions lead to booking
3. **Offer coupons for next booking in exchange for leaving a review**
 - a. Listings having more reviews tend to be booked more
 - b. This would stimulate growth for good listings
 - c. And remove attention from listings that are unattractive or have defects of some sort

Insights from Analysis

Top 5 Points

1. Most popular neighborhoods
2. Top countries that attract guests
3. Rating the different ways to book a listing
4. Most popular room types
5. New versus past bookers

Most Popular Listing Neighborhoods

- **Copacabana** and **Ipanema** are largely the most booked
- Leblon, Barra da Tijuca, and Santa Teresa are also moderately booked
- App has many listings **without** a defined neighborhood

Listing Neighborhood	Count
-unknown-	4346
Copacabana	2928
Ipanema	1457
Leblon	478
Barra da Tijuca	367
Santa Teresa	361

Top countries that attract guests

- **Local Brazilians** make up majority of guests
- **United States is 2nd highest,** significantly books more than (3rd) France, (4th) Argentina, and (5th) United Kingdom
- Out of other countries within South America, Argentina books the most

Guest Country	Count
BR	4281
US	2031
FR	791
AR	711
GB	692

Rating the different ways to book a listing

- “Instant book” and “book it” are the most used channels
- **Very little bookings** are made through “contact me” channel
- Majority of guests prefer “Instant book”

	Contact Channel	Count
0	instant_book	6755
1	book_it	4054
2	contact_me	929

Most popular room types

- **Entire home/apartment** are the most booked listing types
- **Shared rooms** are the least booked listings
- **Private rooms** are moderately booked

	Room Type	Count
0	Entire home/apt	8542
1	Private room	2999
2	Shared room	197

New versus past bookers

- **Past-bookers** make up majority, about 20% more than new guests
- App has few guests **with undefined** user stage

	Guest User Stage	Count
0	past_booker	6372
1	new	5352
2	-unknown-	14

Research, Experiments, and Approaches

Moving forward

1. Quantify reviews by ratings (0-1 stars)
2. Implement proposed key metrics and modify app to include those insights in listing search
3. Collect guest shopping activity data
 - a. What different listing features guests view before booking
 - b. The number of listings viewed before booking one
 - c. The last thing viewed before booking
 - d. How long a guest has used Airbnb
4. Use more data
 - a. This dataset is quite small, a few months of host-guest activity

End