MARRIOTT HOTEL - TECHNICAL PRESENTATION

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Governing Thoughts

High volume of cancelations for Marriott hotels rooms reservations have led to a 18% annual revenue loss due to failure to rent rooms after cancelation; hence, it is required that stricter cancelation policy be implemented and/or use proactive strategies to detect cancelation and apply techniques to secure room reservations.

Technical Approach

Revenue loss can be prevented through the identification of reservations that have high cancelation probability so that strategic measures can be implemented to ensure maximum utilization of each rooms. With this, an increase in revenue by 10% - 15% over the 2020/21 calendar year is expected.

What percentage of rooms have failed to generate revenue due to cancelation and not as result of non bookings?

Can we identify lead metrics that are the drivers behind room booking cancelations?

Provided that there are strong drivers associated with reservation cancelations– can we create a model that can accuracy identify a reservation that will most likely be canceled?

We have been provided with information that indicates that majority of revenue loss are due to cancelations.

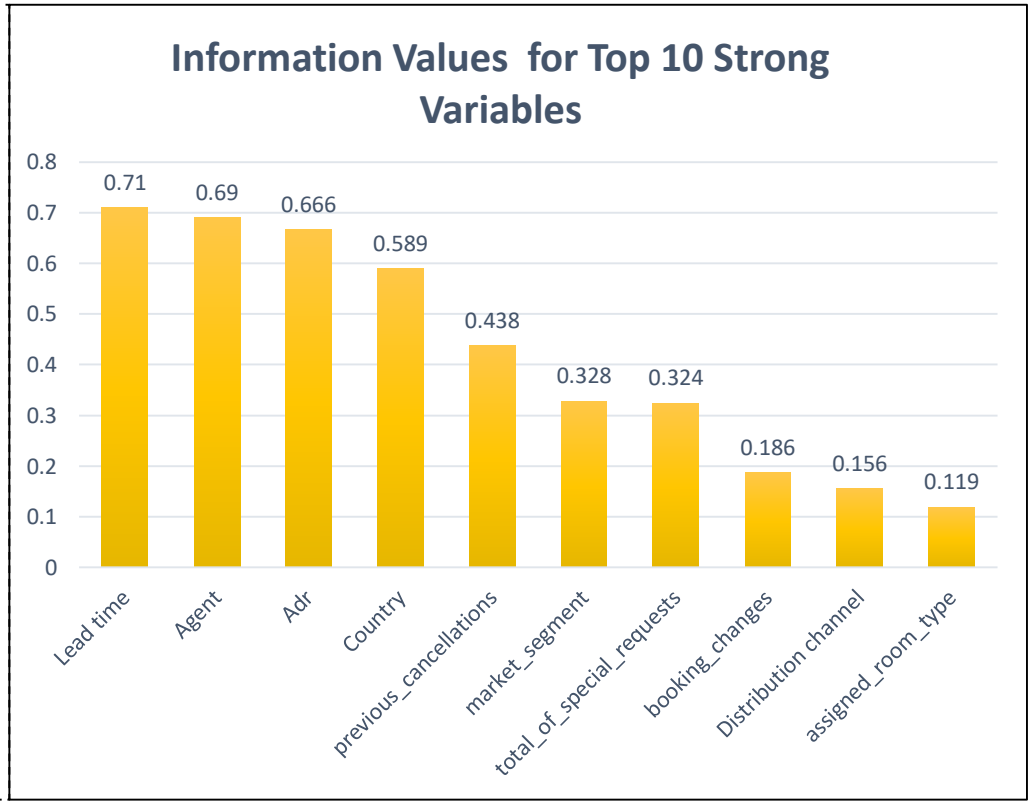
We analyze the data with the assumption that reservation cancelation can be predicted. Provided we cannot prove this- we can conclude that cancelation cannot be predicted with the data available.

If we can create a model – are we able to identify most reservations that are likely to be canceled?

Executive Summary Slides

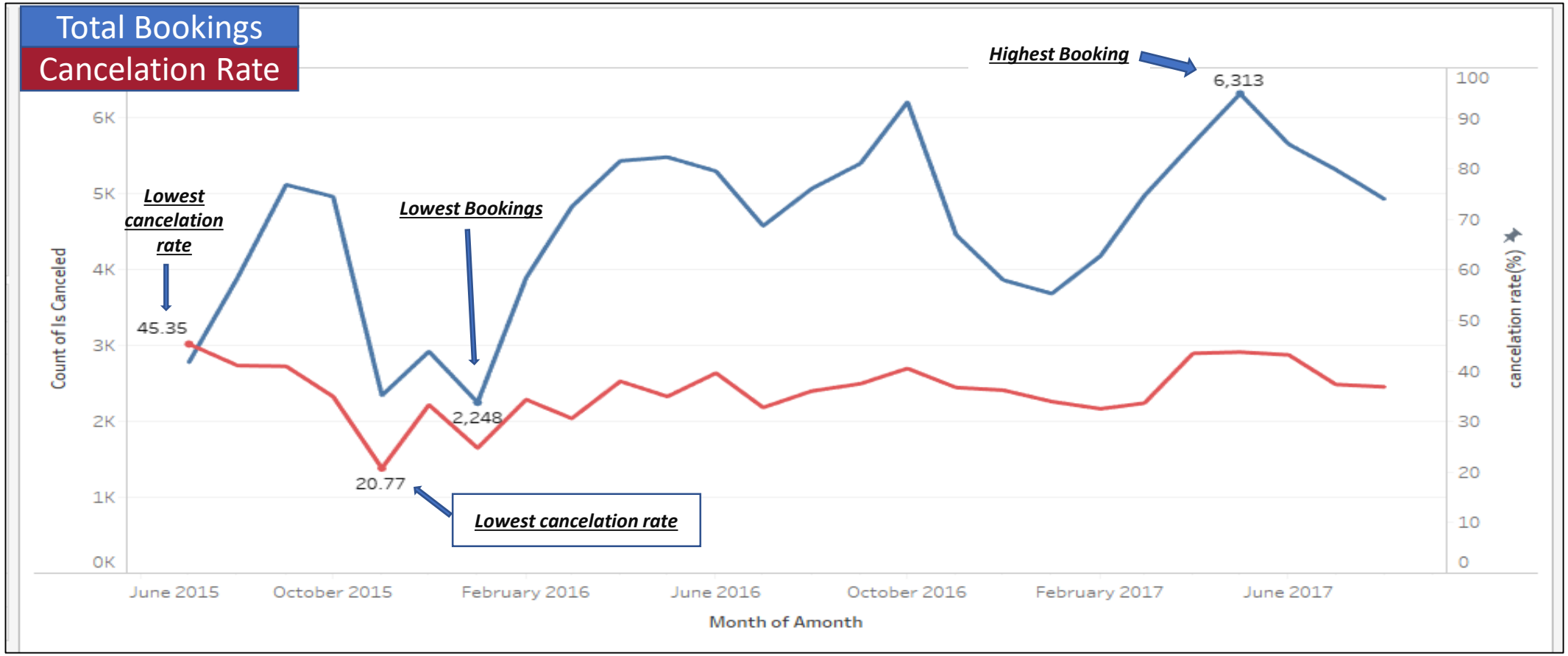
Descriptive and inferential statistical methodologies have proven effective in creating a proactive algorithm model with 78% accuracy to identify reservation that will most likely be canceled. Lead Time, Agent, Total Special Requests and previous cancelation emerging as some of the top variables of interest.

- *Reservations with lead time >30 days are more likely to be canceled.*
- *Reservations with no special request are more likely to be canceled.*
- *Reservations by repeated guests with high cancelation history are likely to cancel.*
- *Booking with FB – Full board (breakfast, lunch and dinner) have highest rate of cancellations*
- *Reservation with 1 more booking change(s) are less likely to be canceled.*
- *Guests who requested parking don't canceled reservation.*

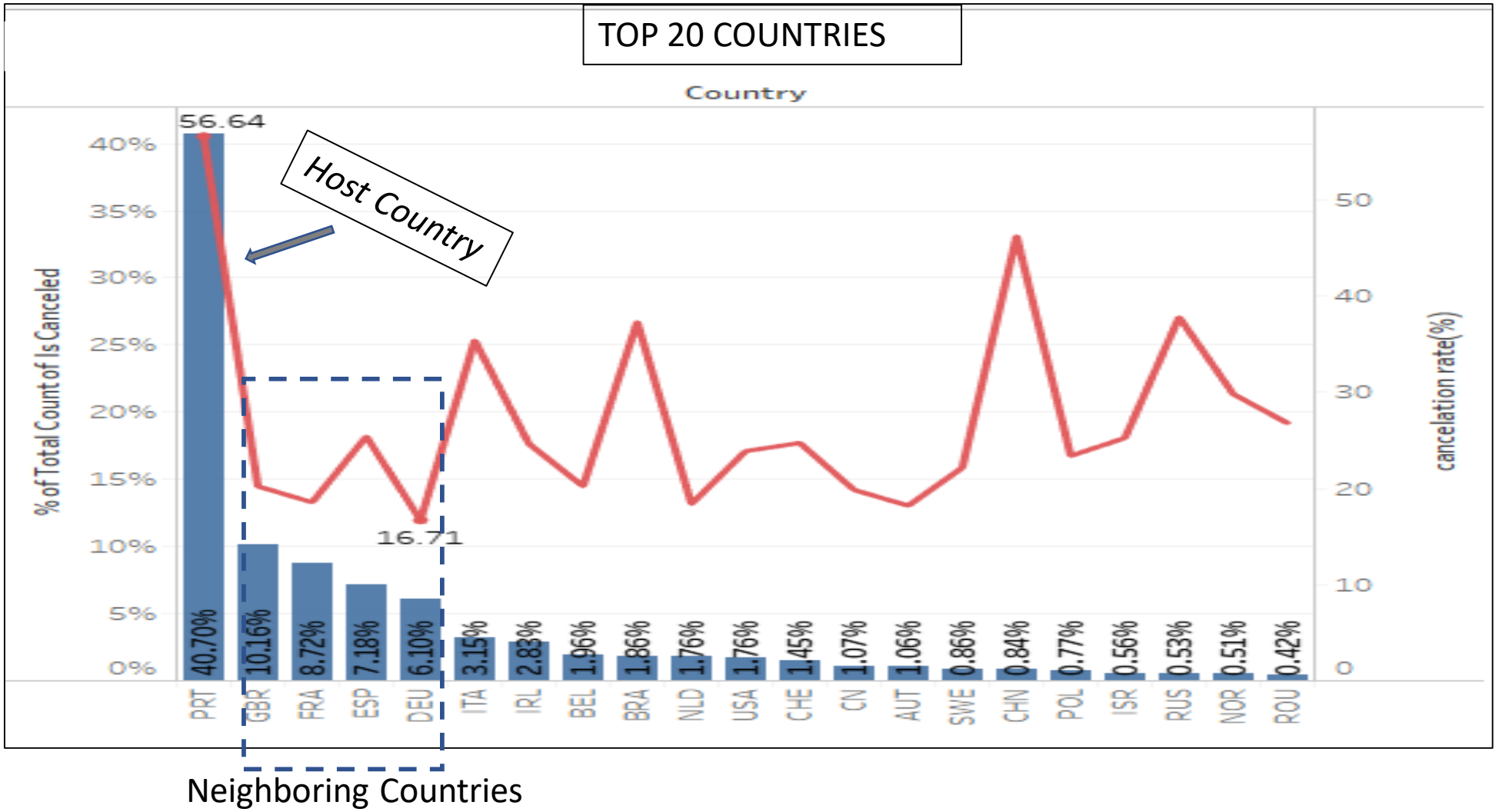


Over the two years period (2015-2017), the highest cancelation rate per month was in June 2015 (45.35%) and the lowest cancelation rate was in October (20.77%) of the same year. 2015 got the lowest total Bookings while June 2017 got the highest bookings for a month. Cancelation was slightly steady between 2016 and 2017.

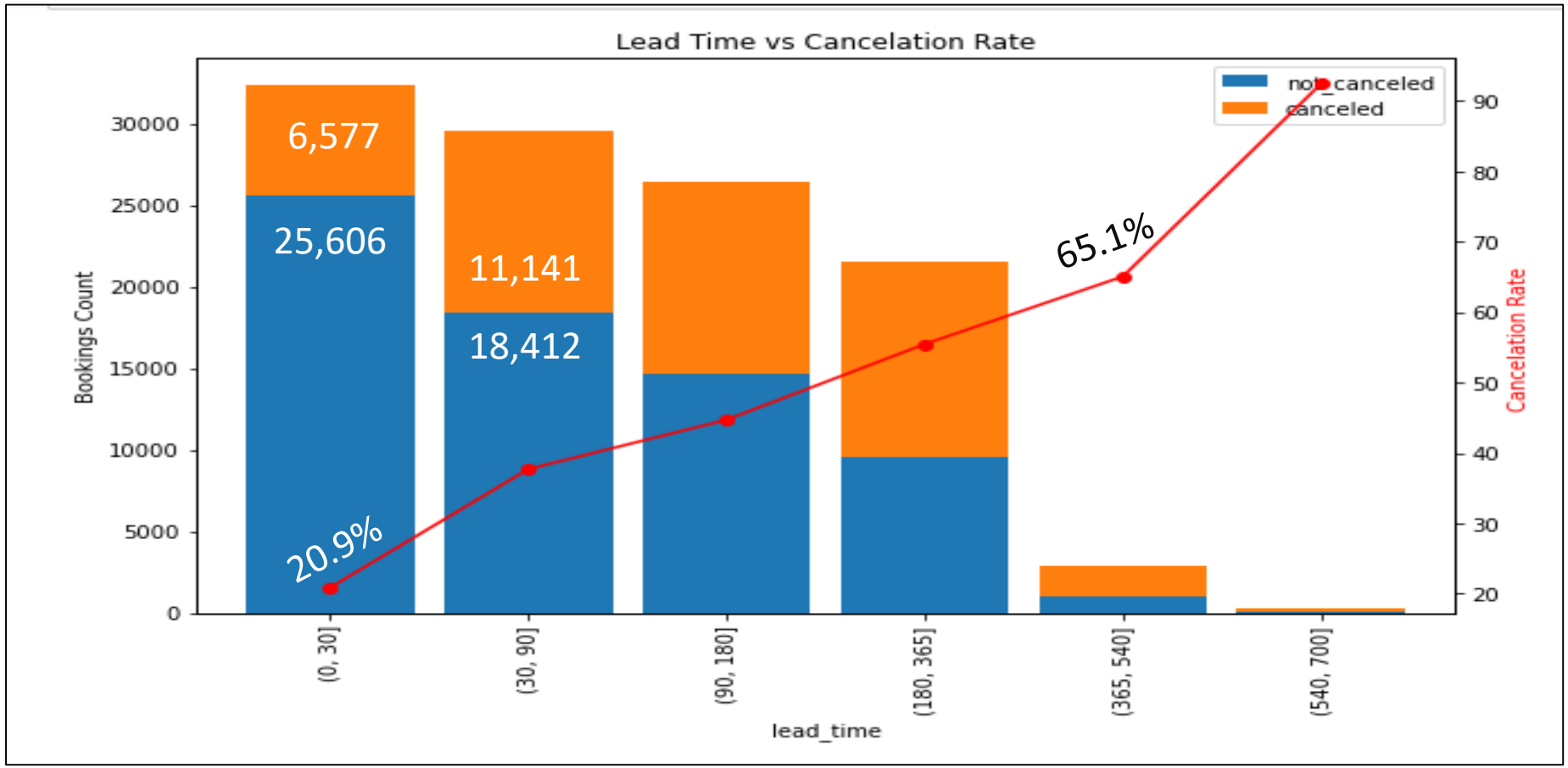
Monthly Bookings and Cancelation Rate (%)



Over 94% of bookings were done by the top 20 countries, out of which 40.07% of those bookings were done by the host country, Portugal. The host country experienced the highest Cancelation rate (56.64 %). This indicates that bookings done by guests who do not have to travel are more likely to cancel. However, bookings from neighboring countries have low cancelation rates.

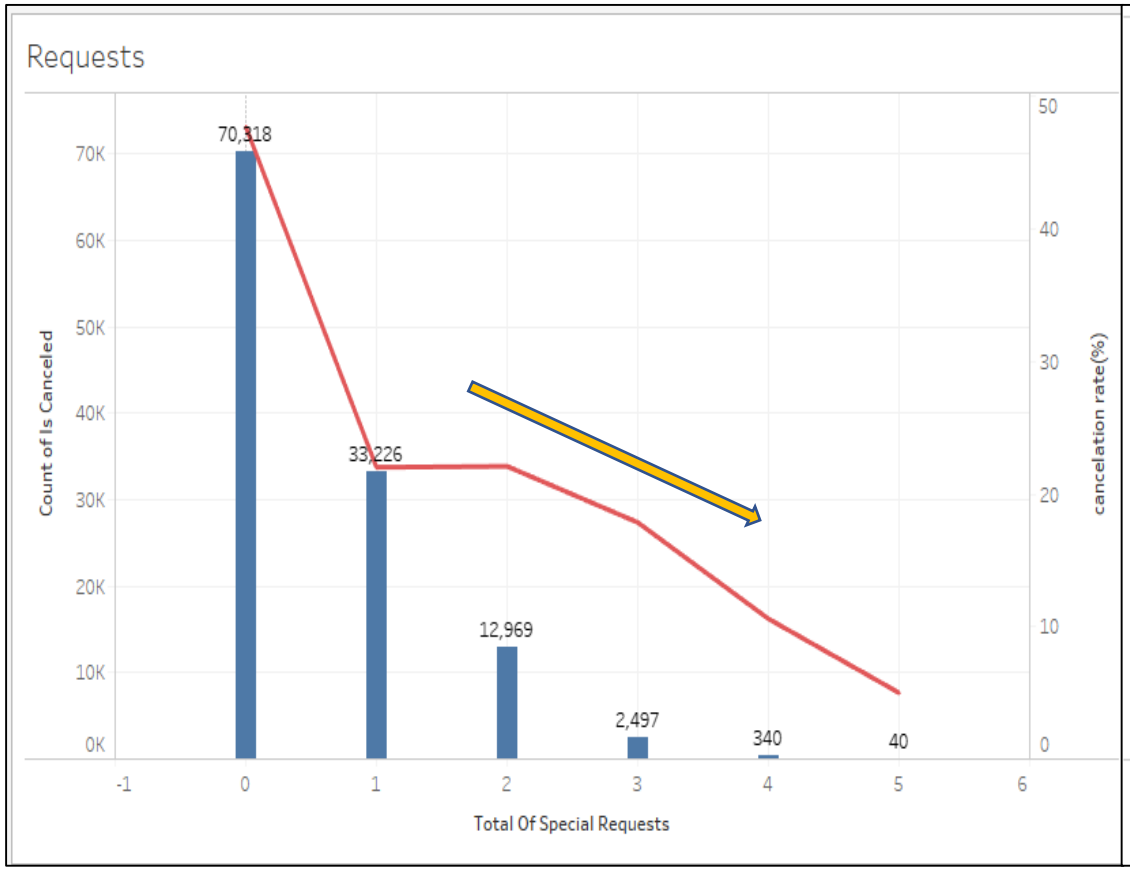


Splitting the lead time into periods; less than a month, month+ to 3 months, 3+ months to 6 months and so on, reveals a strong positive correlation between lead time and cancelation rate. Reservations made under a month prior to arrival date are less likely to be canceled while reservation with over a year early are most likely to be canceled.

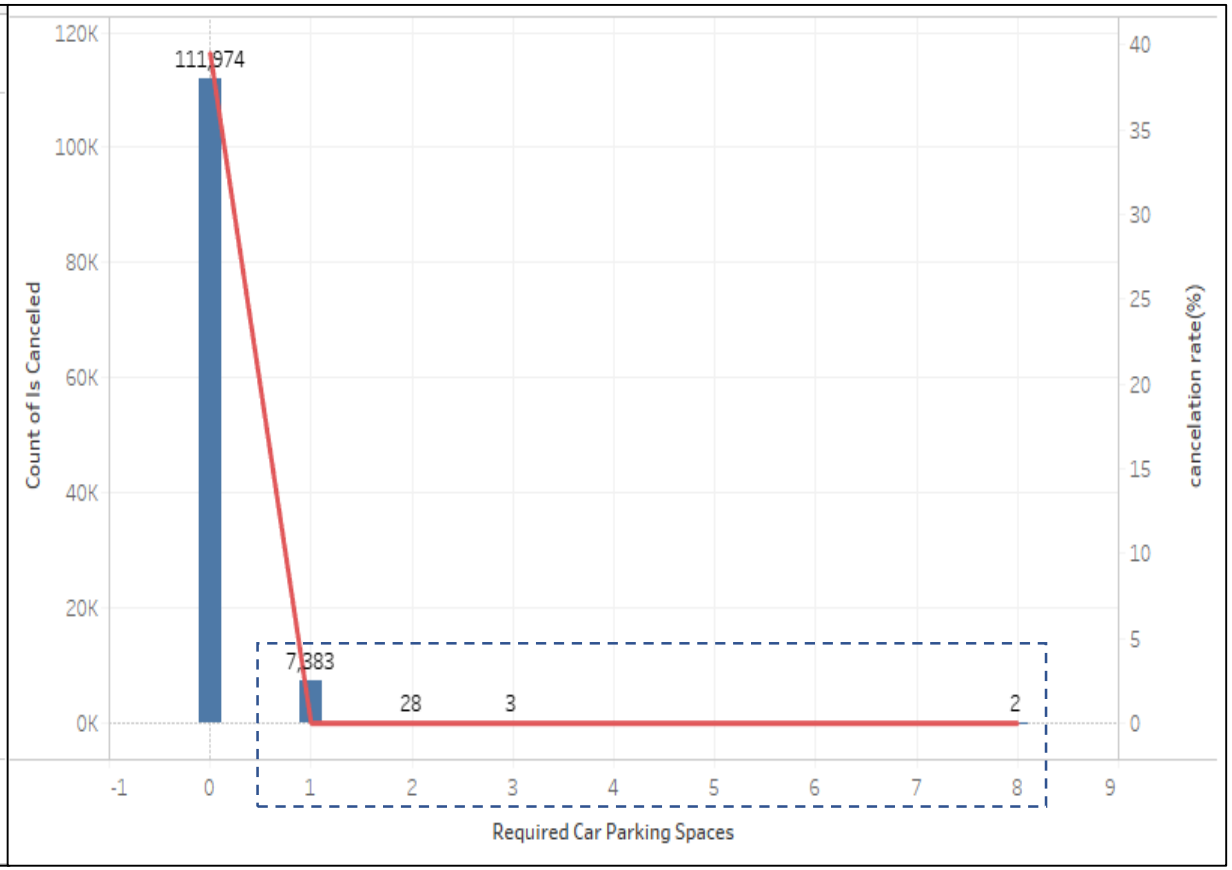


Here much can be taken from 2 key drivers, Total of Special requests and Required Car Parking Space which both have a strong negative correlation with cancelation rate. Reservation with no special request have almost a 50% cancelation rate. Similarly, reservation with no required car parking have almost a 40% cancelation rate. Notably, cancelation rate reduced significantly once there is an increment in either of the variables

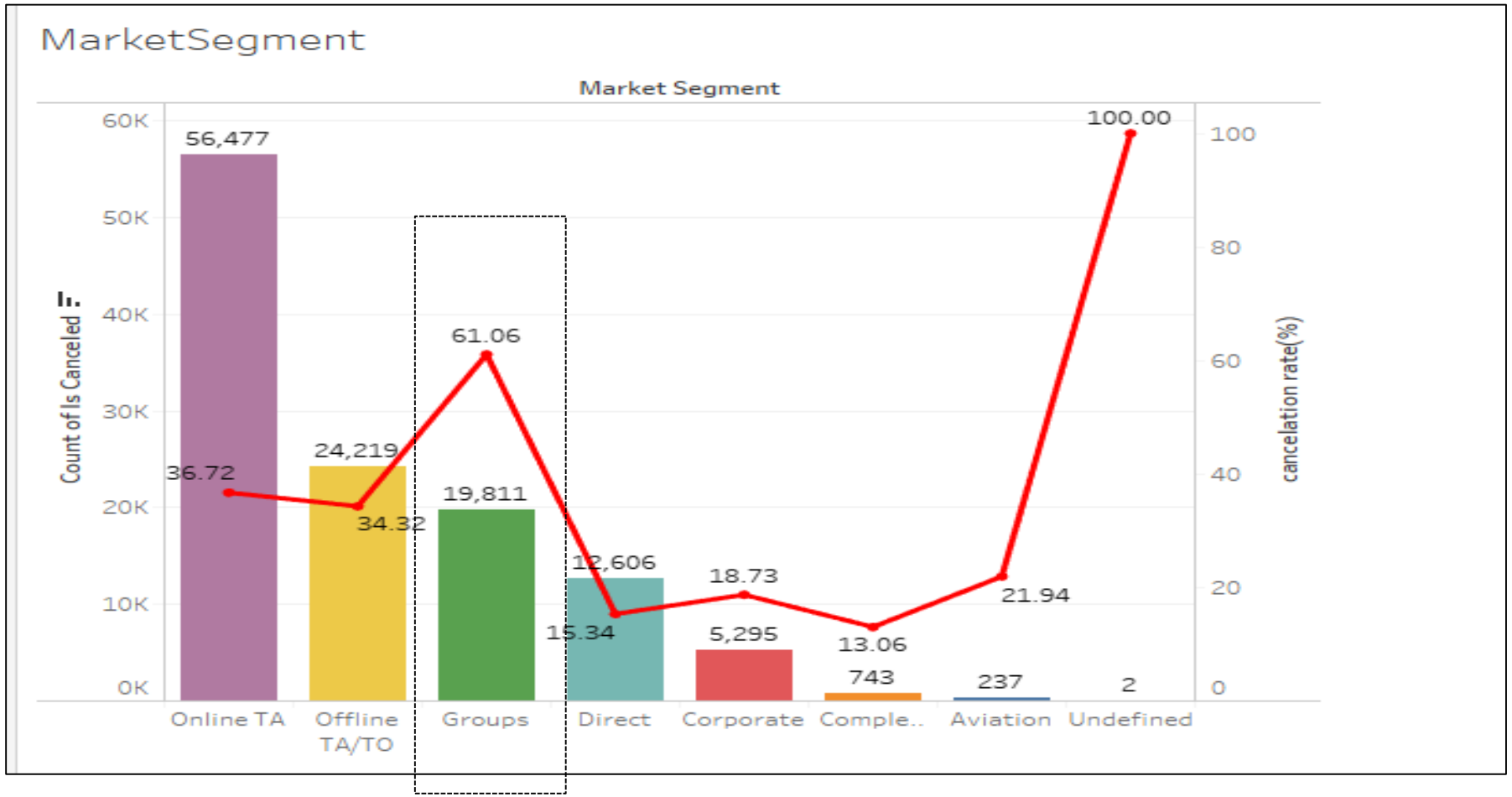
SPECIAL REQUESTS AND CANCELATION RATE



REQUIRED PARKING AND CANCELATION RATE



In market Segment, Online TA received approximately 50% of reservation with a cancelation rate of 36.72. significantly, we can see that group market segment experienced a relatively high cancelation rate (61.06%).



Analysis on Agent attribute reveals that bookings done agent #1 are sure likely to be canceled, as it has a cancelation rate over 73% . This is similar for gent #19 with approximately 74% cancelation rate. Agent #9 got highest number of bookings (26.8% of total bookings) and experienced 41% cancelation rate.

Multivariate Equation

Lastly, to model the Logistic Regression algorithm we need to select the strongest possible variables so that we can get the most precise prediction. Lead time, agent and country are some key variables that were identified using Information Value statistic. Using attributes with IV 0.04 > 0.8 gave the best accuracy rate at 0.78. This indicates that the model is capable to accurately identify approximately 78% of booking cancelations.

We neglect IV that are less than 0.04. those are considered to be too weak

INFORMATION VALUES FOR VARIABLES