

#### Business Background



Maintain inventory to "MAXIMIZE PROFIT"



#### Keep Existing Customer

 Know customer preference and ensure guest satisfaction



#### Add New Customer

 Targeted marketing – sell to right customer at the right price



#### Maximize Efficiency

 Detect cancellation and replace with new booking

#### How to Maximize Profit





#### Link to Kaggle Dataset

- City Hotel in Lisbon and Resort Hotel in Algarve
- Check in date 1 July 2015 31 August 2017
- 32 columns, 119390 rows





### Know your Customer



#### **()1** REPEATER GUEST

- Only 3.63%
- Even smaller percentage for city hotel
- Single customer
- From corporate
- Lowest room category
- Lower ADR

#### is **BUSINESS TRAVELLER**

#### 02 NEW GUEST

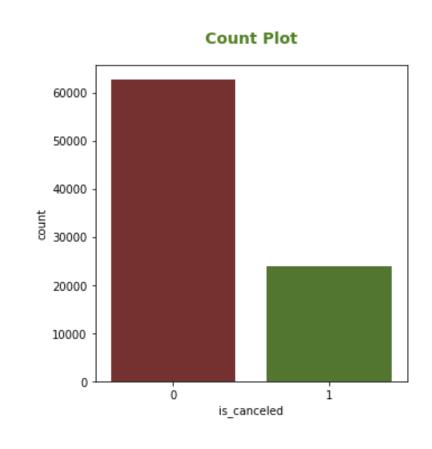
- City hotel > Resort hotel
- Mostly couple
- From Online Travel Agent
- Lowest room category

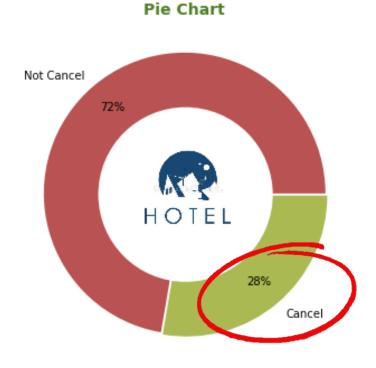


# Why Does Cancellation Matter?

#### **Hotel Cancellation**

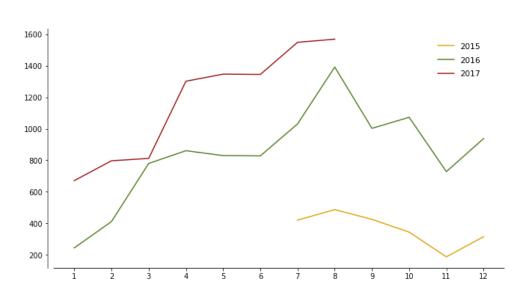


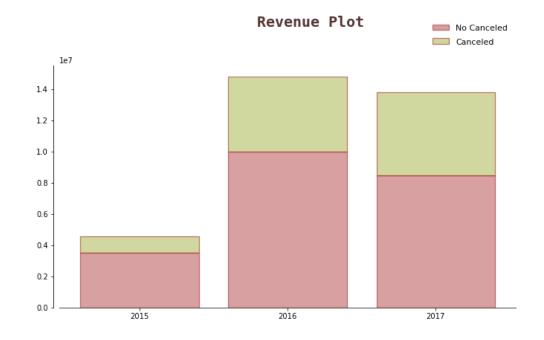




# Why Does Cancellation Matter?



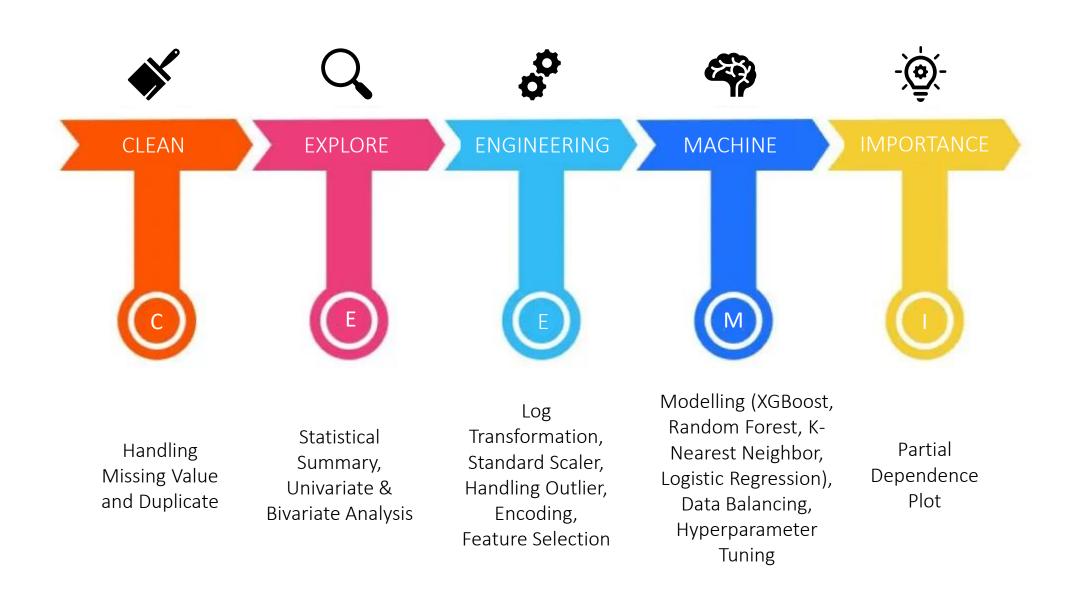




O1 Cancellation increases over the year

Loss in revenue increases over the year

### Workflow



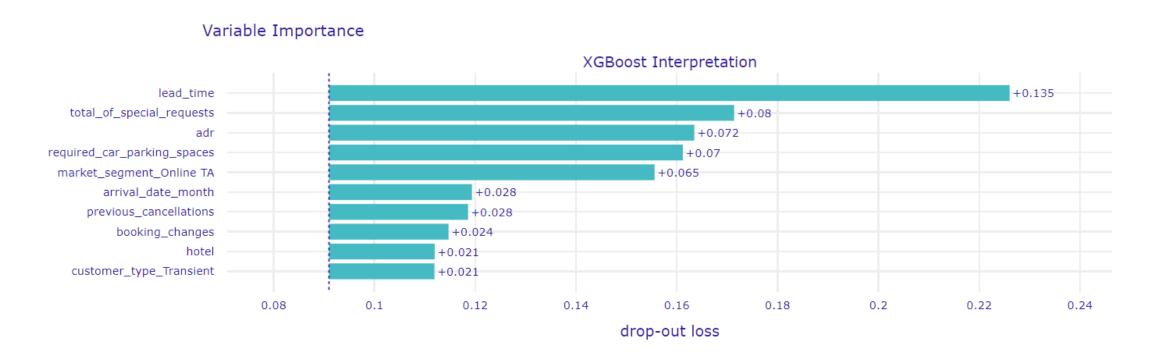
#### Cancellation Model

Model Performance Tuning						
	Model	Parameter	Accuracy	Precision	Recall	F1
0	XGBoost	{'max_depth': 10, 'n_estimators': 100}				
2	Random Forest	{'max_depth': 70, 'n_estimators': 500}	74.78%	54.04%	74.80%	62.75%
3	K-Nearest Neighbours	{'metric': 'manhattan', 'n_neighbors': 20, 'weights': 'distance'}	70.41%	48.63%	75.03%	59.01%
1	Logistic Regression	{'C': 11.288378916846883, 'penalty': 'l2'}	70.09%	48.27%	74.60%	58.62%

# XGBoost is the BEST model to predict cancellation

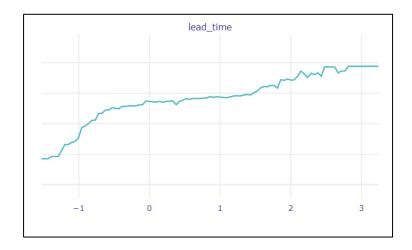
Key Metric: Recall and F1

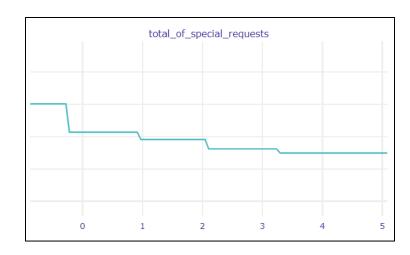
# Variable Importance

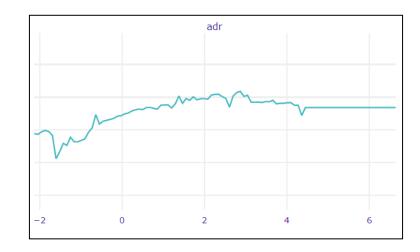


Lead time is the most importance feature, followed by total of special request and ADR

# Variable Importance









Higher lead time means higher cancellation

Guests who book far from check-in date are more likely to cancel



Many special request means lower cancellation

Guests who make request are serious about the booking and less likely to cancel



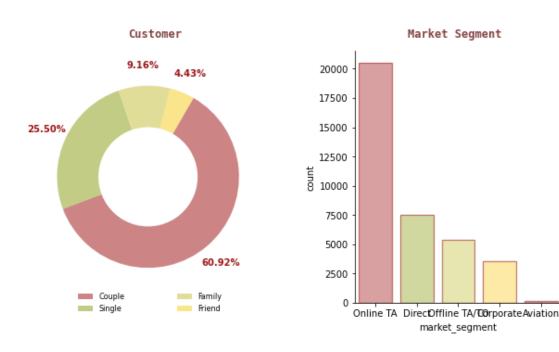
Higher ADR means higher cancellation

Guests tend to book at higher rate, but can be canceled with flexibility

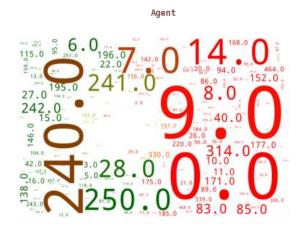




## Lead Time







#### Marketing Campaign:

- Couple getaway
- Romantic holiday
- Honeymoon

Targeted Flash Promotion through Online TA for Portugal, Spain, or European Market only Special promotional rate / cashback / commission to selected agent only

# Targeted Customer to Replace Cancellation



## Recommendation - Keep Existing Customer



Recap guest complaint



YOUTVE FARNED A REWARD!

Membership program

Send guest survey upon check-out





VIP recognition

#### Recommendation - Add New Customer









- Increase brand awareness for Resort Hotel
- Shift booking to
- direct booking
- Reduce price gap for lower and higher room category



# Recommendation – Maximize Efficiency



More stringent cancellation policy



Non refundable booking with advance purchase discount



**Link to Script** 

