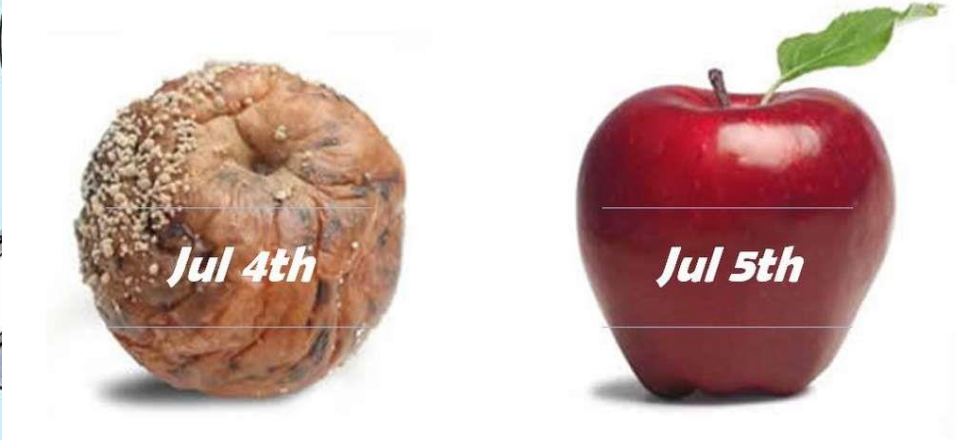


A polished brass nameplate and a hotel bell are placed on a dark wooden desk. The nameplate is rectangular with a slightly raised back and features the text 'HOTEL BOOKING ANALYSIS' in a large, bold, serif font, followed by 'by : Louisa Veronica' in a smaller, sans-serif font. The bell is a classic hotel bell with a rounded top and a small handle. The background is a blurred view of a hotel lobby with wooden paneling and a staircase.

HOTEL BOOKING ANALYSIS

by : Louisa Veronica

Business Background



Hotel sells "PERISHABLE INVENTORY"
Today's rooms can't be sold again tomorrow



Maintain inventory to
"MAXIMIZE PROFIT"

How to Maximize Profit



Keep Existing Customer

- Ensure guest satisfaction



Add New Customer

- Targeted marketing – sell to correct customer at the correct price



Maximize Efficiency

- Detect cancellation and replace with new booking



Data Understanding



[Link to Kaggle Dataset](#)

- City Hotel in Lisbon
- Resort Hotel in Algarve
- 32 columns, 119390 rows

PORTUGAL



A person wearing a dark suit and a white shirt is holding a torn, white, spiral-bound notepad with both hands. The notepad is held in front of their chest, displaying a message in bold, black, sans-serif capital letters. The background is a plain, light-colored wall.

**A SATISFIED
CUSTOMER
IS THE BEST
BUSINESS
STRATEGY
OF ALL**

Know your Customer

Know your Customer

01 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

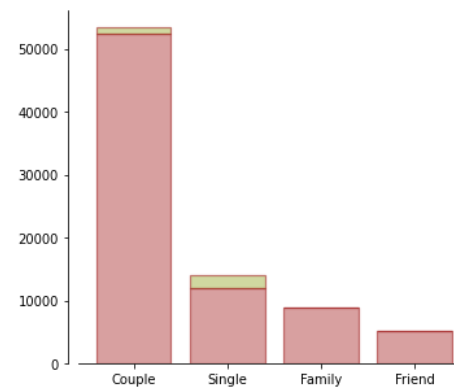
Customer Plot

Non Repeater Guest Repeater Guest

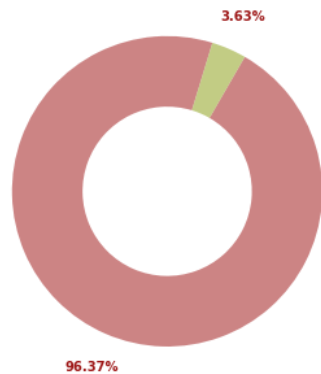
Hotel



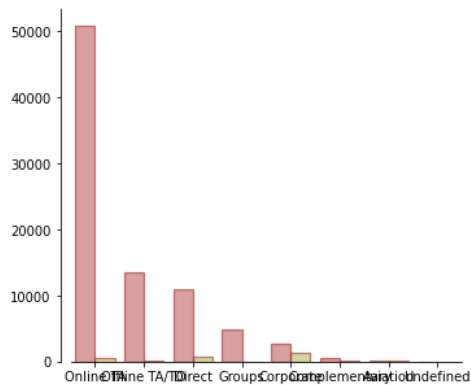
Customer



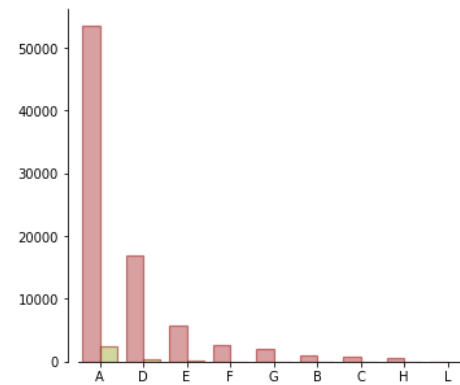
Repeated Guest



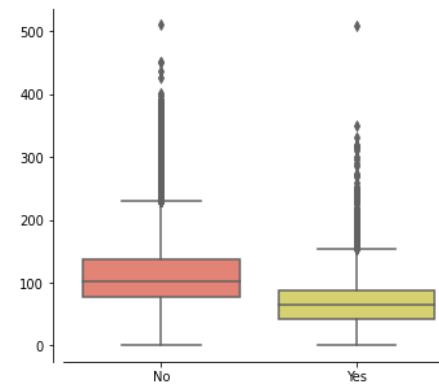
Market Segment



Reserved Room Type



ADR



Know your Cancellation

efficiency

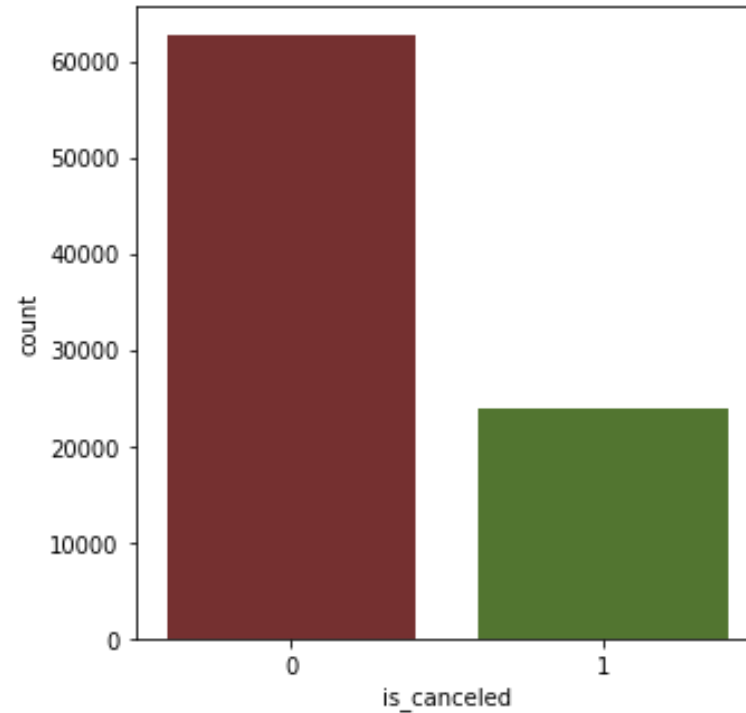
A hand holding a blue pen with a white arrow pointing upwards and to the right, symbolizing growth or progress. The background is dark blue.

Why Does Cancellation Matter?

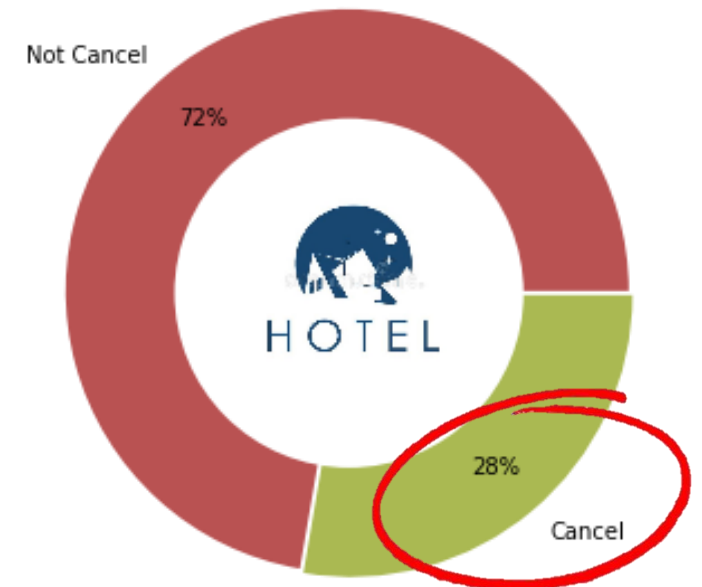


Hotel Cancellation

Count Plot

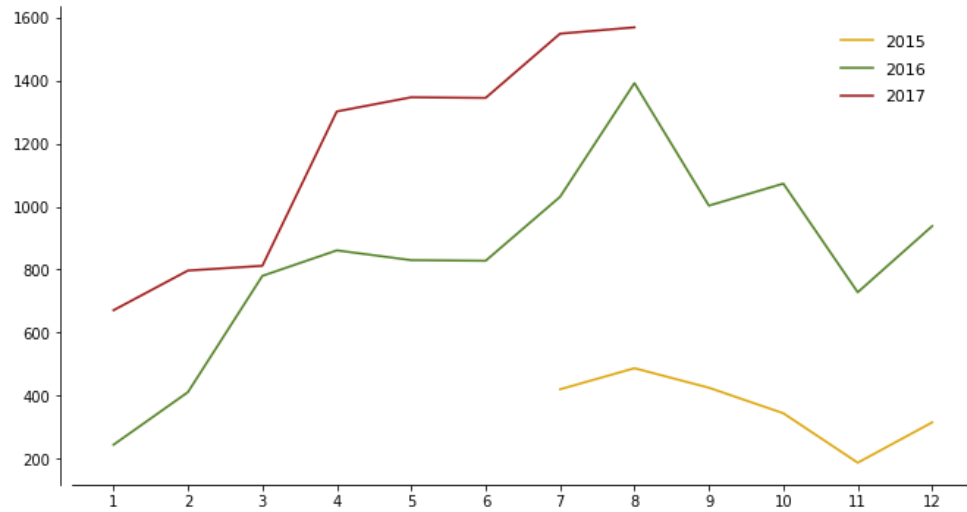


Pie Chart

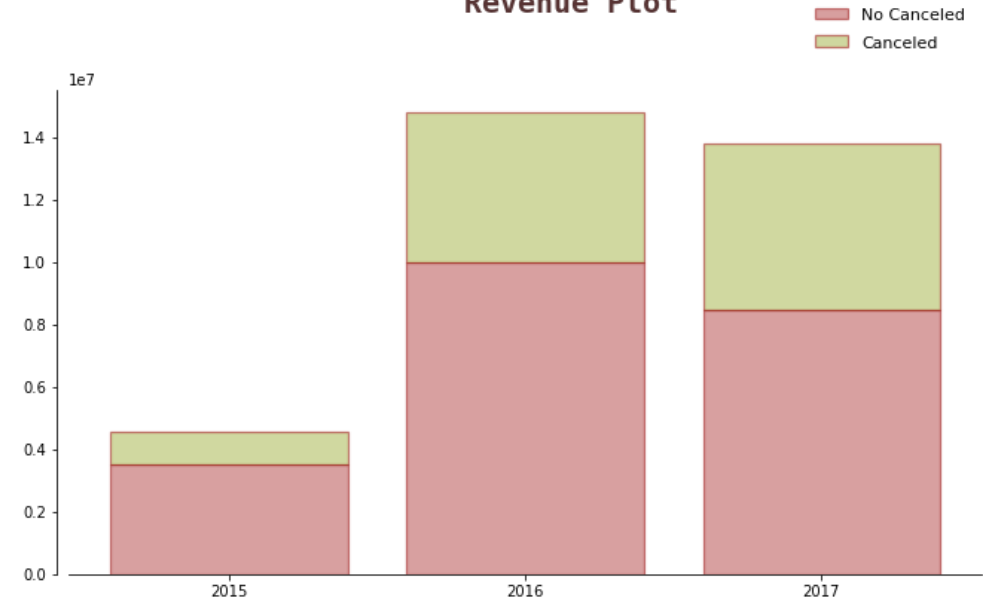


Why Does Cancellation Matter?

Monthly Cancellation by Year



Revenue Plot



01

Cancellation increases over the year

02

Loss in revenue increases over the year

Cancellation Model

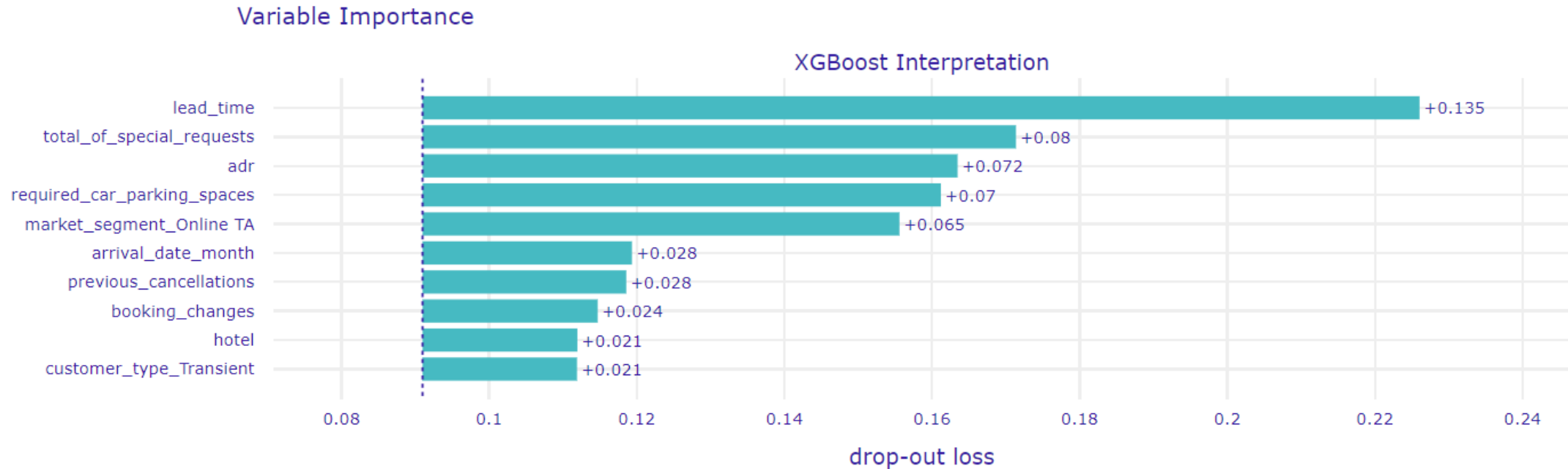
Model Performance Tuning						
	Model	Parameter	Accuracy	Precision	Recall	F1
0	XGBoost	{'max_depth': 10, 'n_estimators': 100}	75.16%	54.49%	75.79%	63.40%
2	Random Forest	{'max_depth': 70, 'n_estimators': 500}	74.78%	54.04%	74.80%	62.75%
3	K-Nearest Neighbours	{'metric': 'manhattan', 'n_neighbors': 20, '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

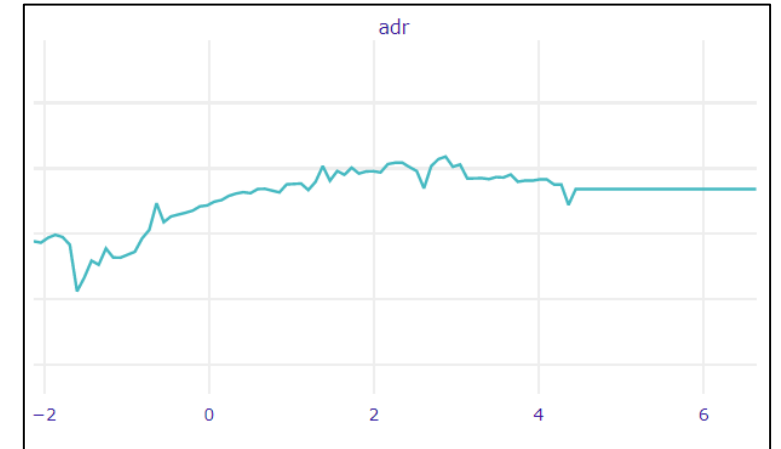
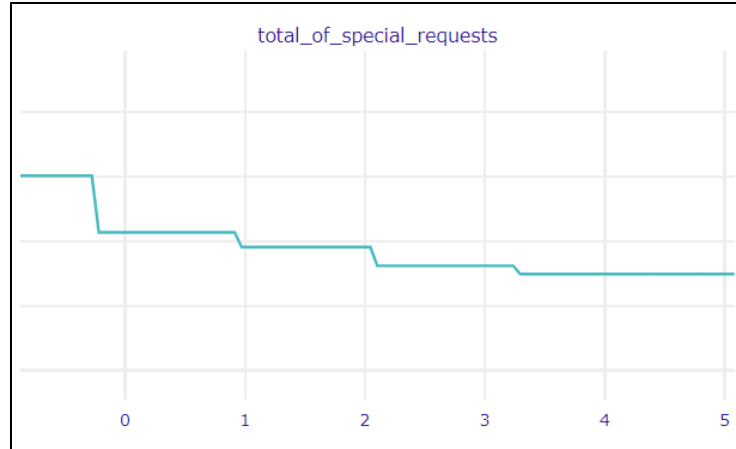
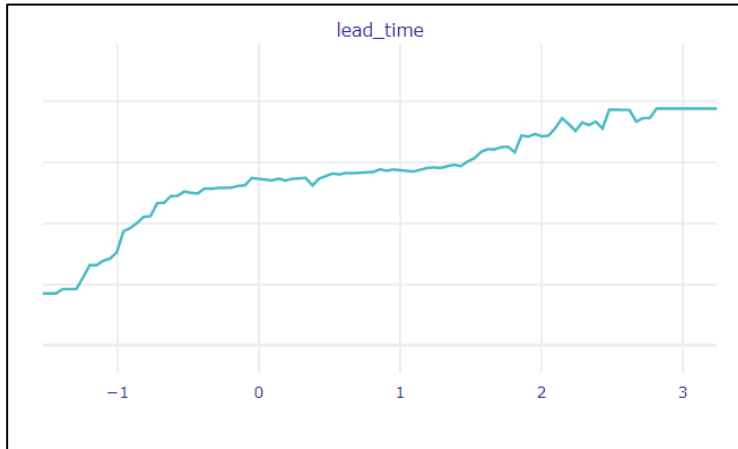
Key Metric : Recall and F1

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

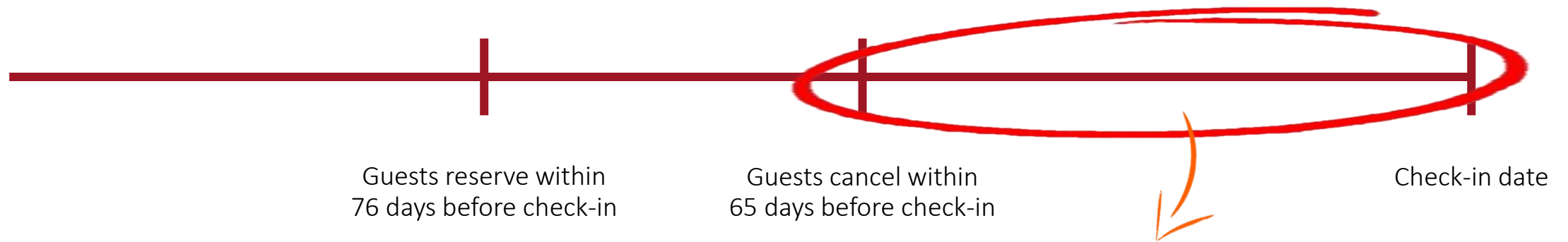


**Higher ADR means
higher cancellation**

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

Replace Cancellation



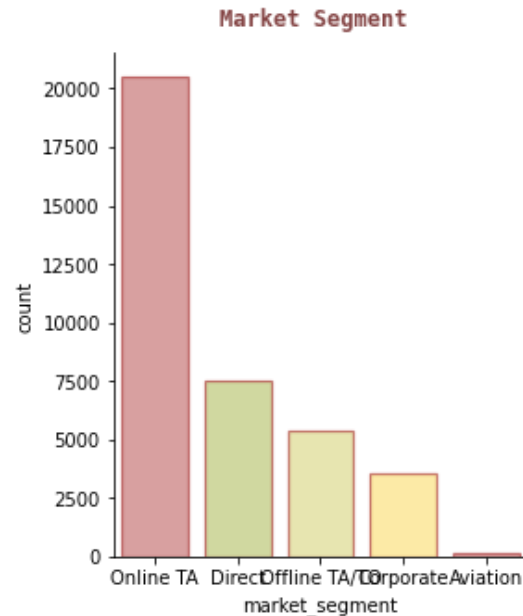
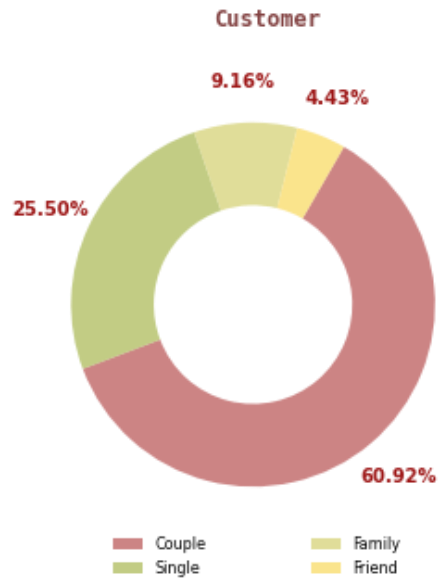


Hotel has to find booking replacement
within 65 days before check-in date



WHO ARE THESE GUESTS?

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



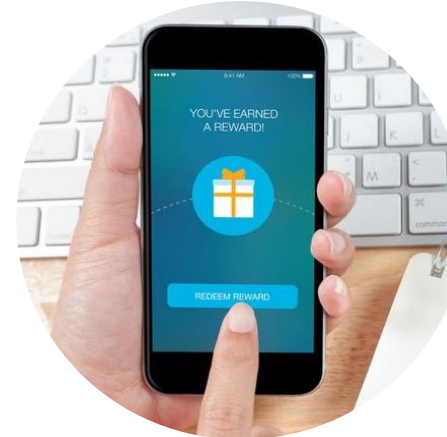
Recommendation

Recommendation - Keep Existing Customer

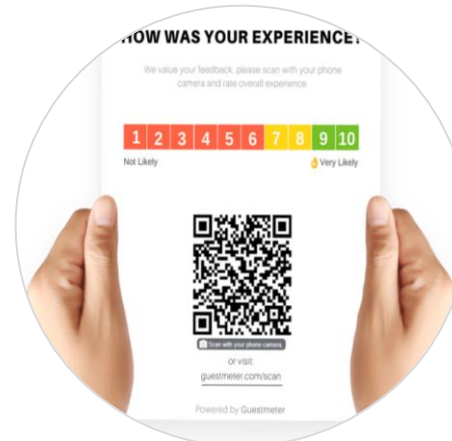
Recap guest complaint



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](#)

