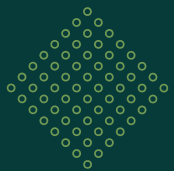


GLOBAL HOTELS AND RESORTS ANALYSIS

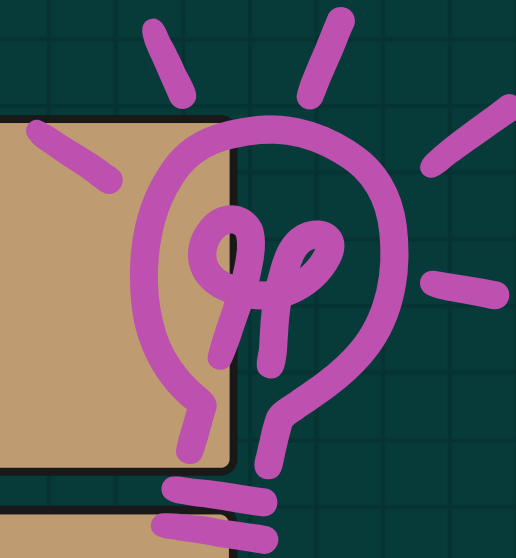
RIT
BUSINESS ANALYTICS
COMPETITION 2024





TEAM

BUSINESS AS USUAL



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MEET OUR CLIENT



AGENDA

01

Data Preparation

Handling null values & creating new features

02

Revenue Calculation

Upgrade loss, Cancellation loss & Revenue

03

Predictive Model

Predicting Upgrades using CatBoost Model

04

Cancellation Policy

Cancellation factors & our recommendations

05

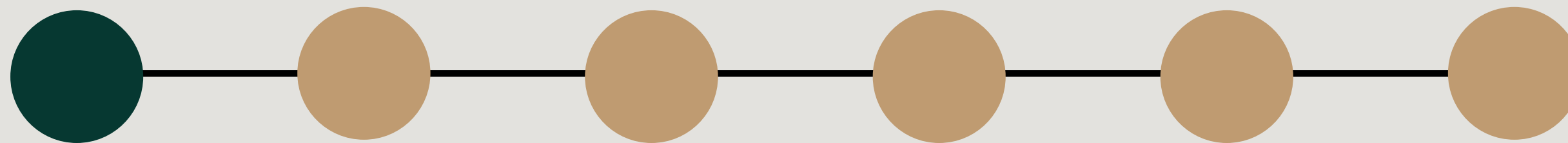
Maximizing Potential Revenue

Exploring other areas to increase revenue

06

Conclusion

Q&A Time

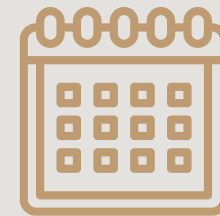


Data
Preparation

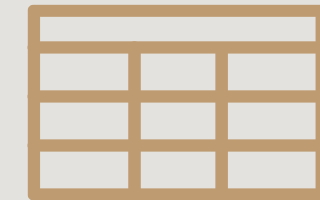
DATASET



Dataset consists **94,364** rows and **28** columns documenting booking reservations at GHR.



Dataset contains booking reservations spanning from **Q4 of 2015 - Q4 of 2017**



Dataset contains columns such as ReservedRoom, ADR, LeadTime, MarketSegment etc.

DATA CLEANING

Column Name	Null Values Count
AssignedRoom	7
BookingCompany	89634
BookingDistributionChannel	5
BookingParking	12
Country	243
DepositType	3
NumberOfChildren	4
ReservedRoom	2
TravelAgent	10721

FEATURE ENGINEERING

LengthOfStay

=StayInWeekendNights +
StayInWeekNights

TotalGuests

=NumberOfChildren +
NumberOfBabies+
NumberOfAdults

DepartureDate

= ArrivalDate +
LengthOfStay

is_family

0 : No babies/children
1 : either baby/children

is_upgraded

0 : not upgraded
1 : upgraded

ADR_category

very_low, low,
medium, high

Length_of_stay_category

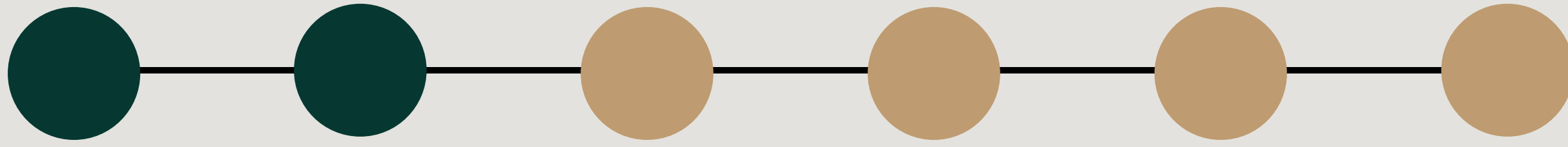
very short, short,
medium, long

lead_time_category

very short, short,
medium, long, very long

MarketCategory

Business /
Leisure



Revenue Calculation

POTENTIAL REVENUE

**Potential Revenue = Revenue Gain
(from hotel stays + from non-refundable cancellations) -
Revenue Loss from free upgrades - Revenue Loss from last-minute
cancellations.**

UPGRADES

What is an Upgrade?



Room Type A
(Reserved)



Room Type G
(Assigned)

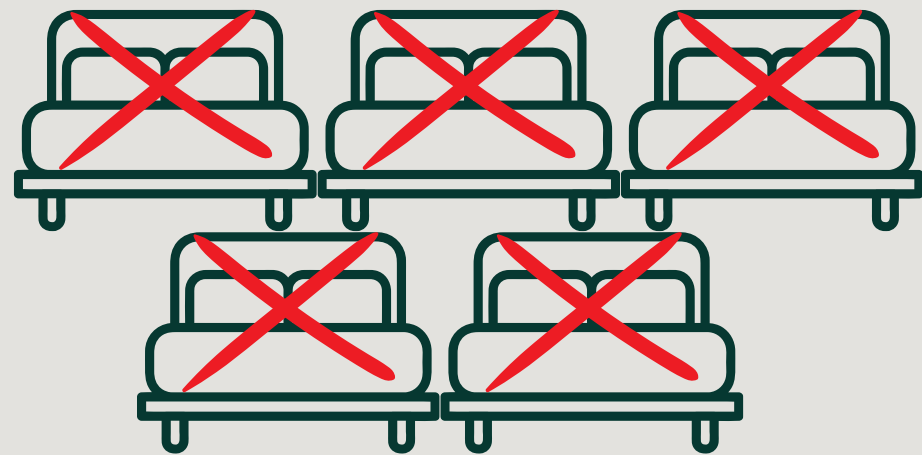
Reasons for Free Upgrade

- Overbooking

- Special Occasions

WHAT IS CONSIDERED AN UPGRADE LOSS?

Scenario



Room Type A

€ 20

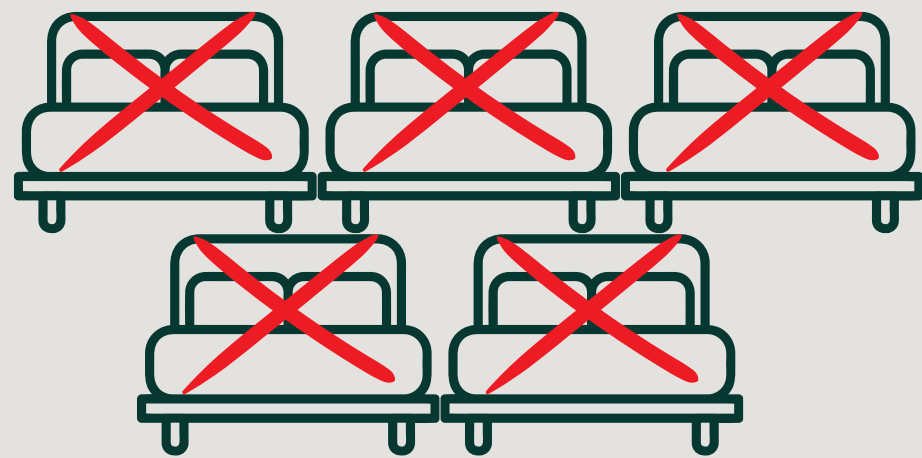
€ 50



Room Type G

CAN UPGRADES BE PROFITABLE?

Scenario



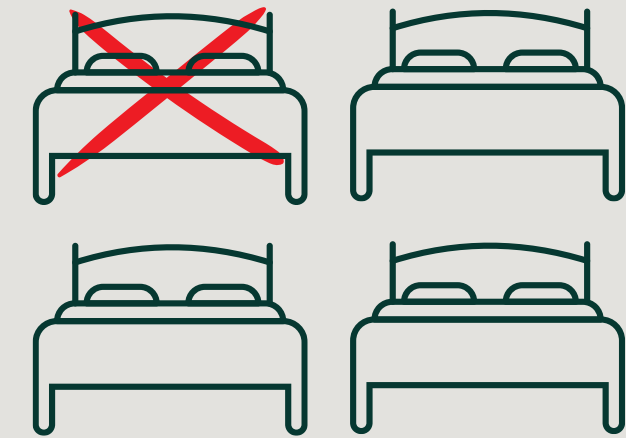
Room Type A

€ 20

€ 25



€ 18



Room Type B

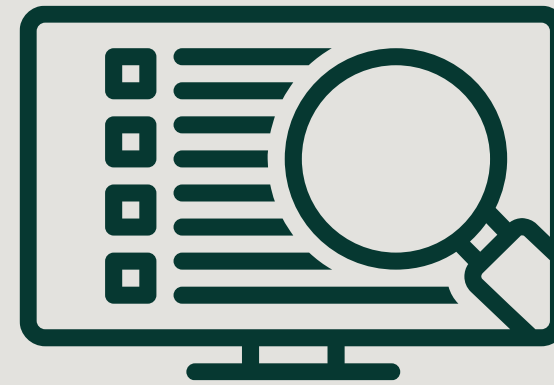
HOW DO WE ESTABLISH TYPICAL SELLING PRICE?

Scenario



Booking attributes

Booking Date : 10/20/2016
Total Guests : 3
Deposit Type : Non-refund
Market Segment : Online TA



Previous Bookings

We use **Spearman's Rank Test** to identify which Booking attributes influence the ADR most.



Average ADR

We calculate the Average ADR of these similar bookings to establish what the typical selling price was.

CANCELLATION LOSS

	Advance Cancel	Last Minute Cancel
No Deposit	0	$(ADR * LengthOfStay) - ADR$
Refundable	0	$(ADR * LengthOfStay) - ADR$
Non-Refund	$-(ADR * LengthOfStay)$	$-(ADR * LengthOfStay)$

LET'S TALK MONEY

Revenue Gain

Upgrade Loss

Cancellation Loss

Total Revenue
(2015 - 2017)
€ 20.4 M

Upgrade Loss
(2015 - 2017)
€ 272,202.05

Cancellation Loss
(2015 - 2017)
€ 1.2 M

Potential Revenue



€20,424,198.90

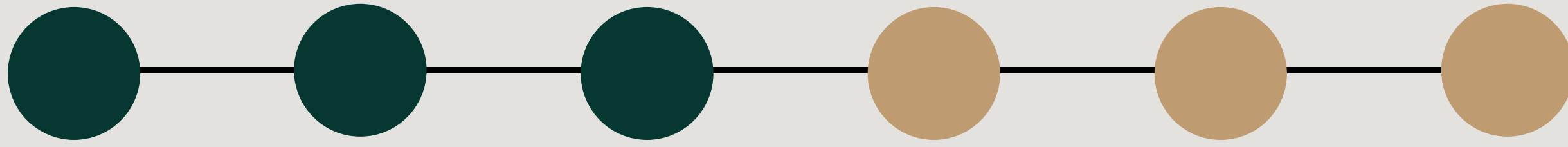


€ 272,202.05



€ 1,228,895.04

€18,923,101.80 is the Potential Revenue (2015-2017) of GHR.



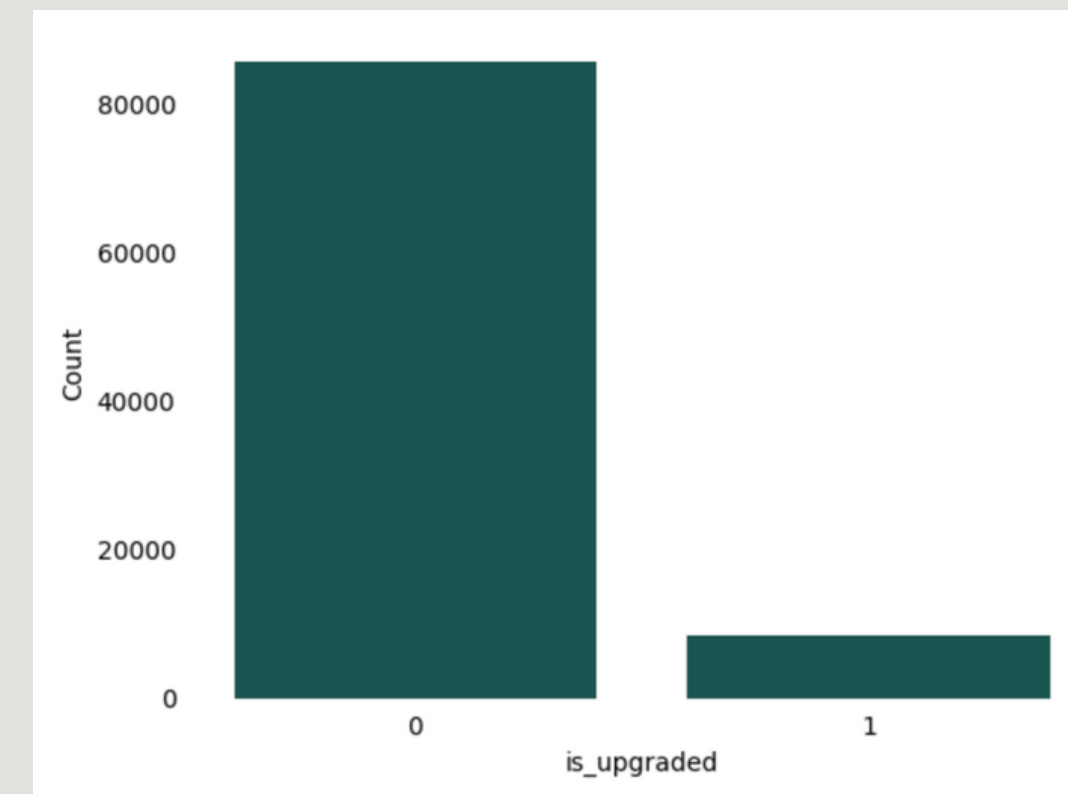
**Predictive
Model**

WHAT ARE WE PREDICTING?

We are predicting instances where a customer will be upgraded.

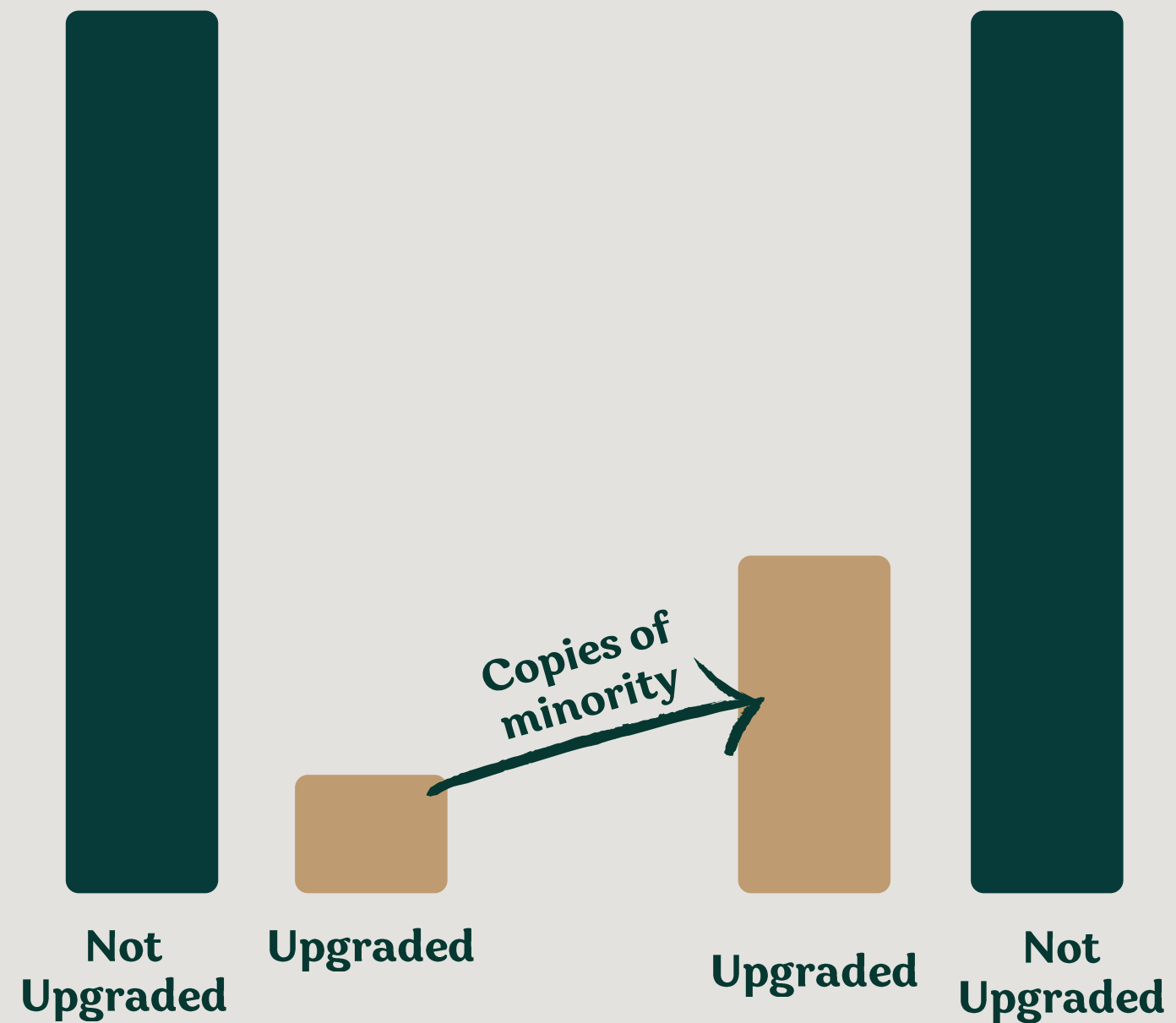
is_upgraded
0 : not upgraded
1 : upgraded

Data Imbalance

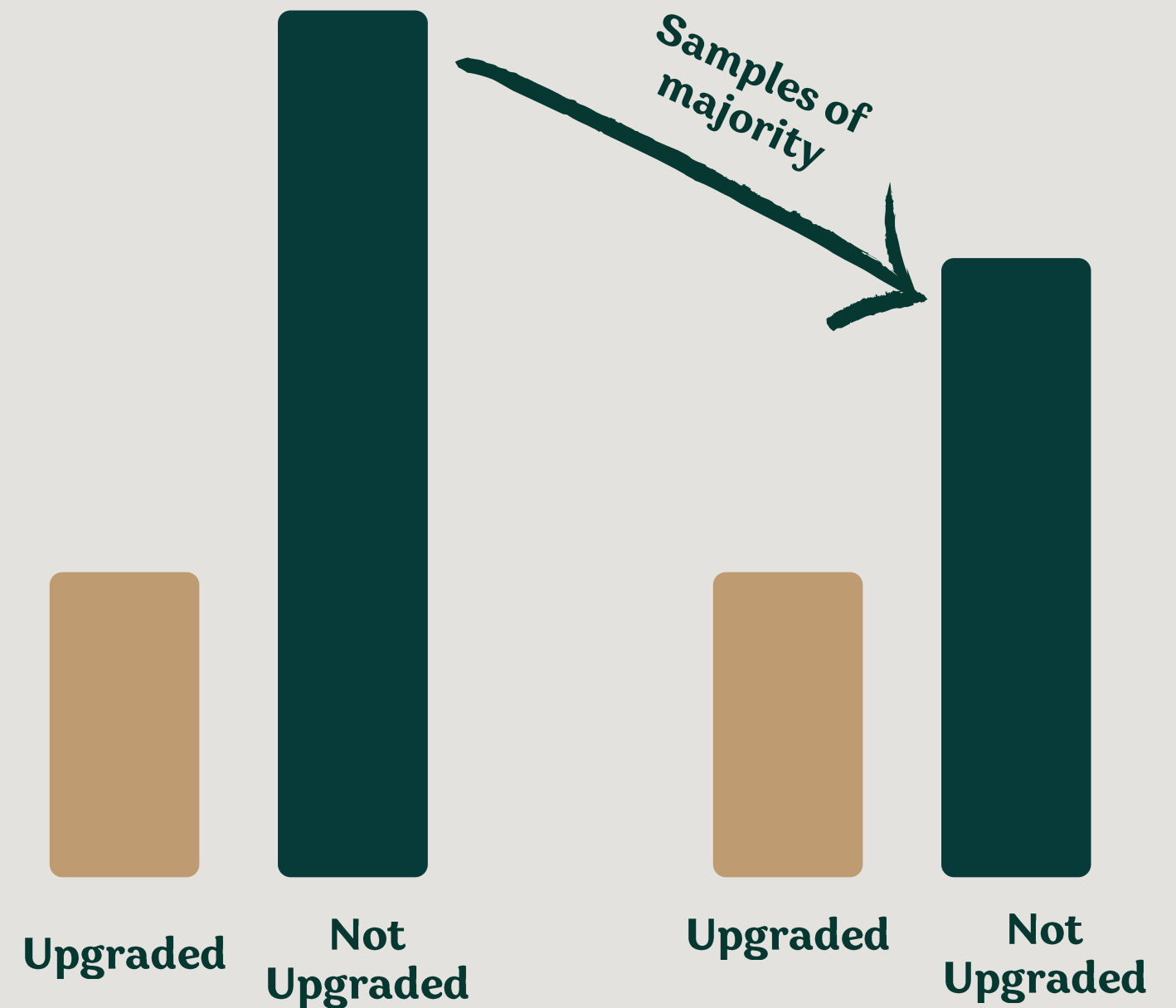


HANDLING DATA IMBALANCE

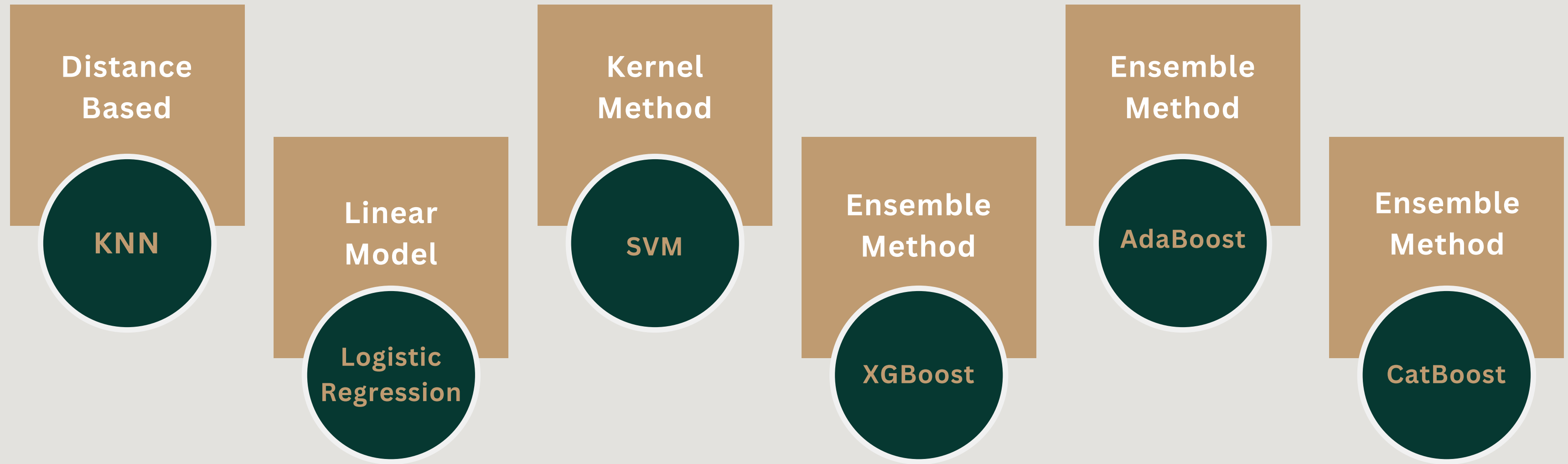
Oversampling



Undersampling



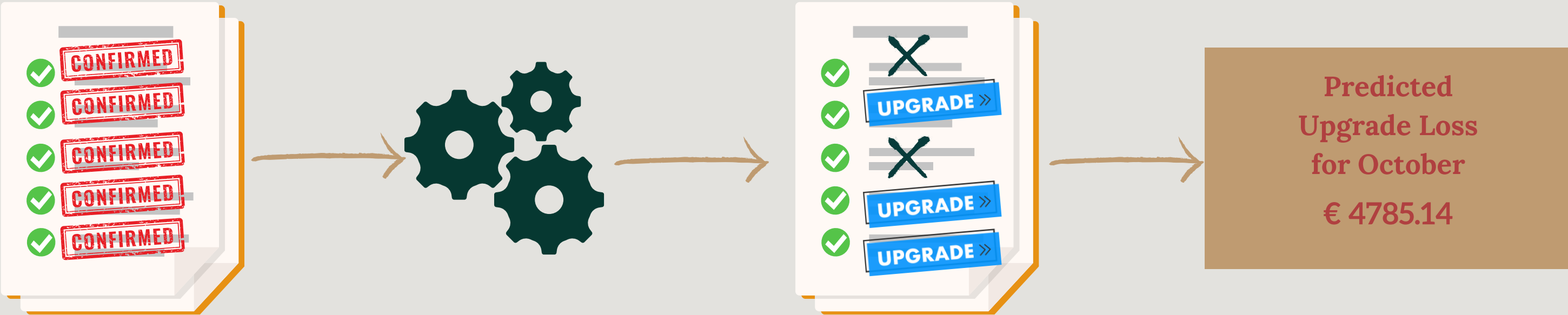
MODEL SELECTION



CatBoost
F1 : 0.40

HOW CAN GHR USE THIS PREDICTIVE MODEL?

Application 1: Optimizing Overbookings (Model tuned for Recall)



October Reservations

CatBoost Model tuned for Recall

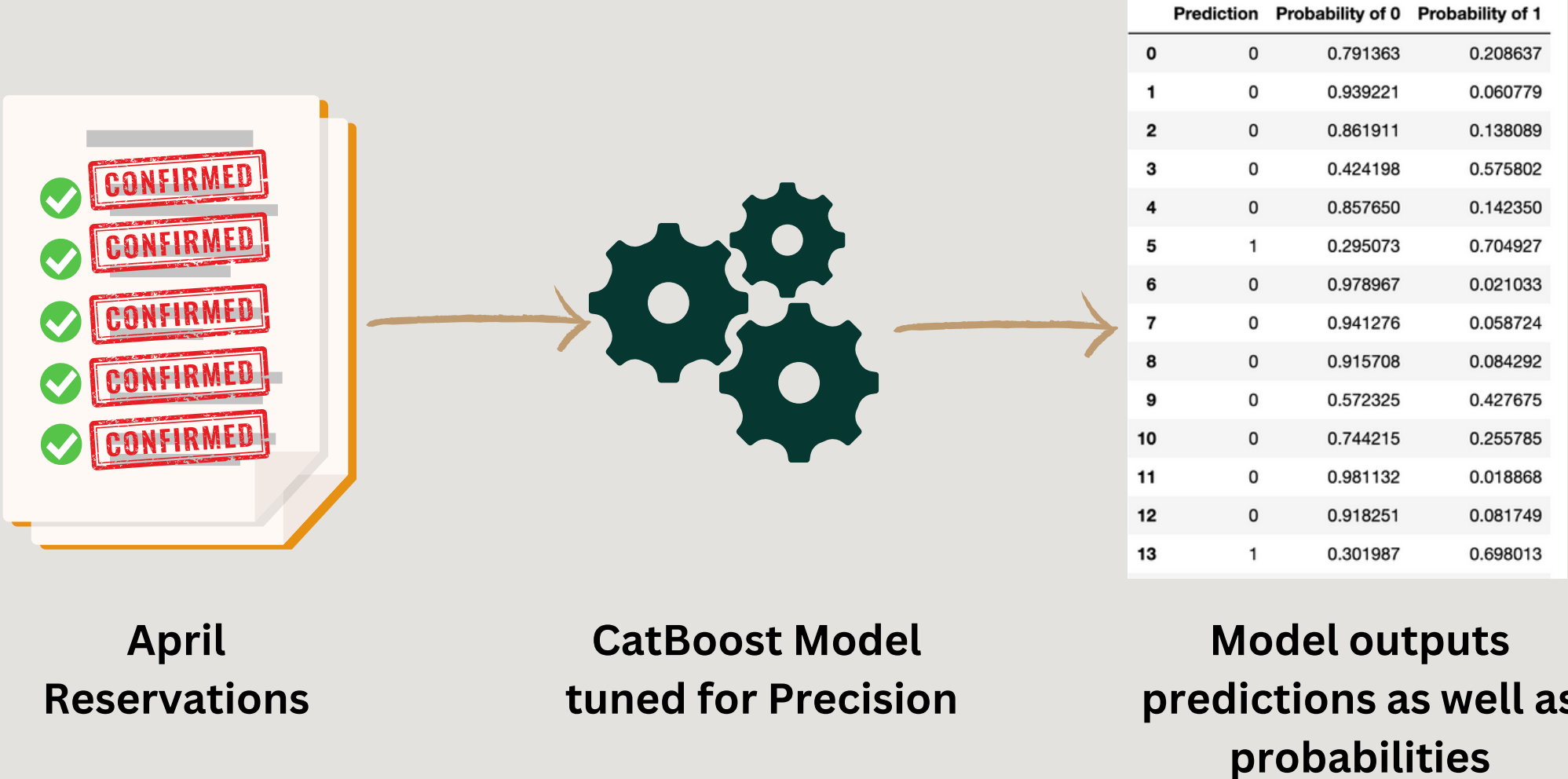
Model has identified instances of upgrades

Using our Upgrade loss logic, calculate revenue loss

Compare this Revenue loss with previous months to optimize overbooking.

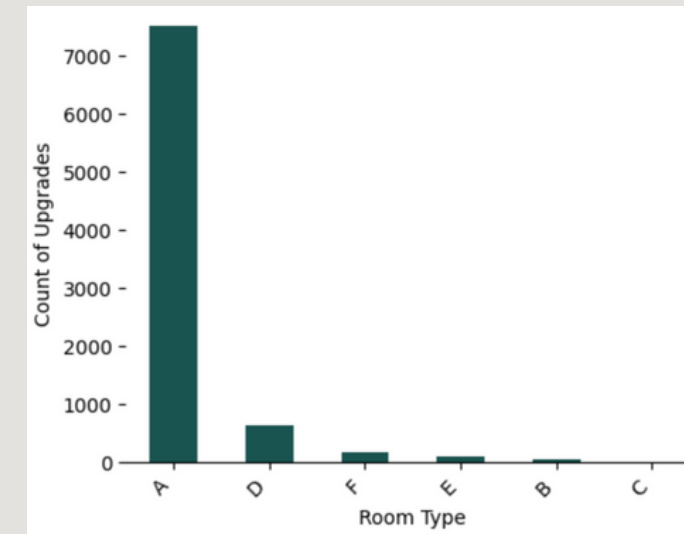
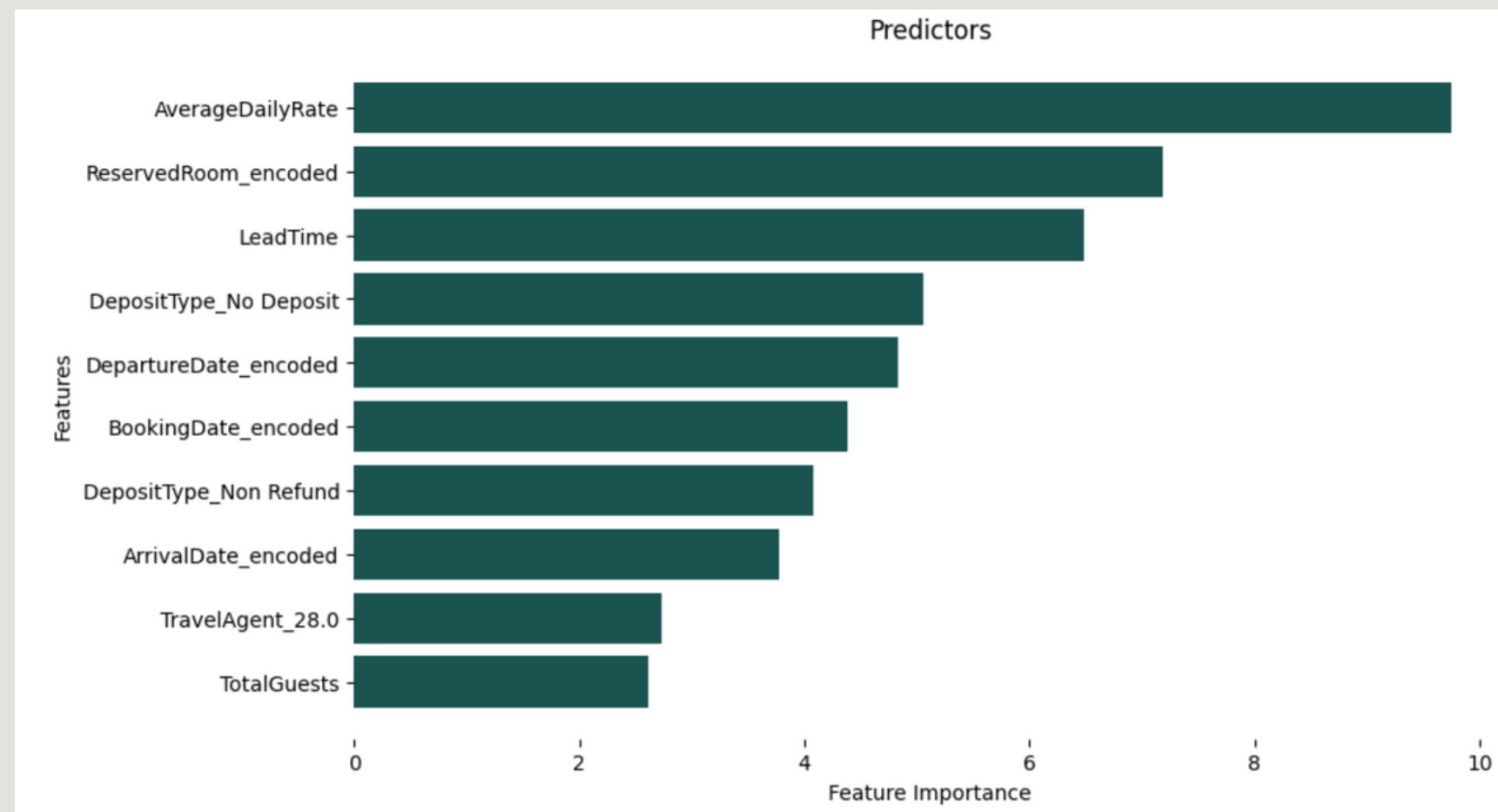
HOW CAN GHR USE THIS PREDICTIVE MODEL?

Application 2: Improve Preparedness (Model tuned for Precision)

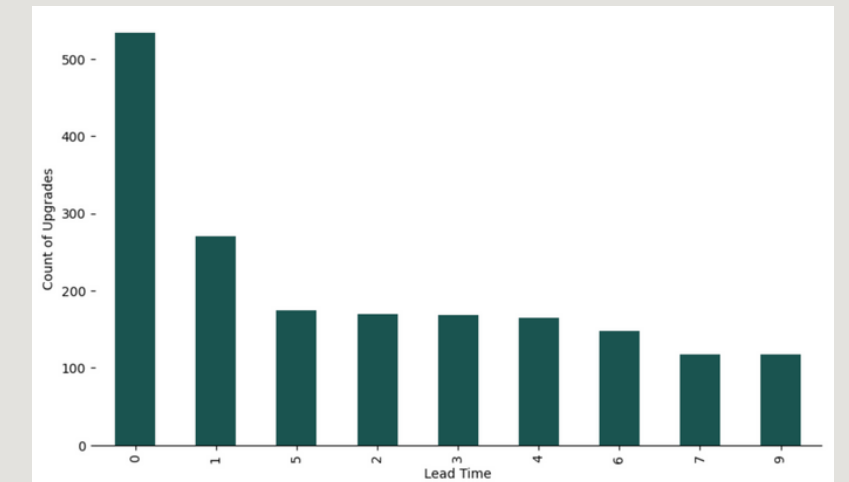


For reservations with really high probability of getting upgraded, GHR can ensure resource allocation and strategic planning for the customer's arrival.

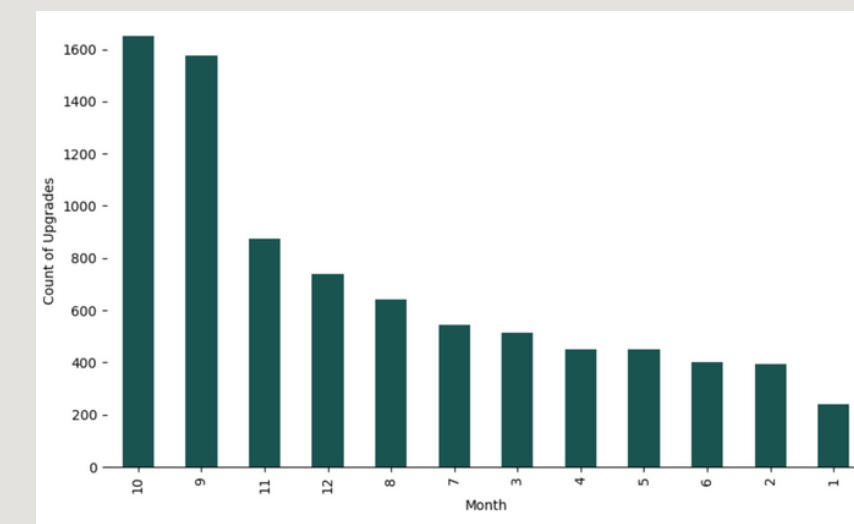
MODEL EXPLAINABILITY



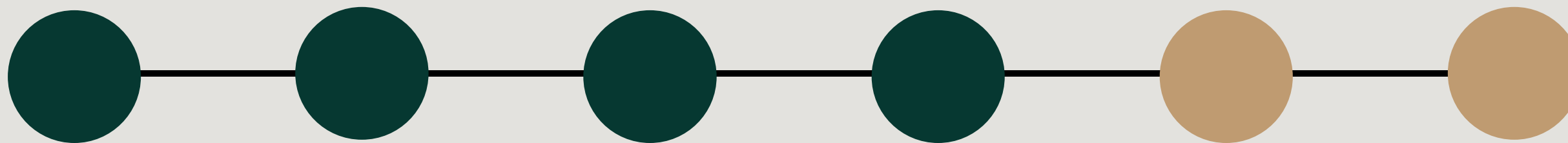
Room type



Lead Time



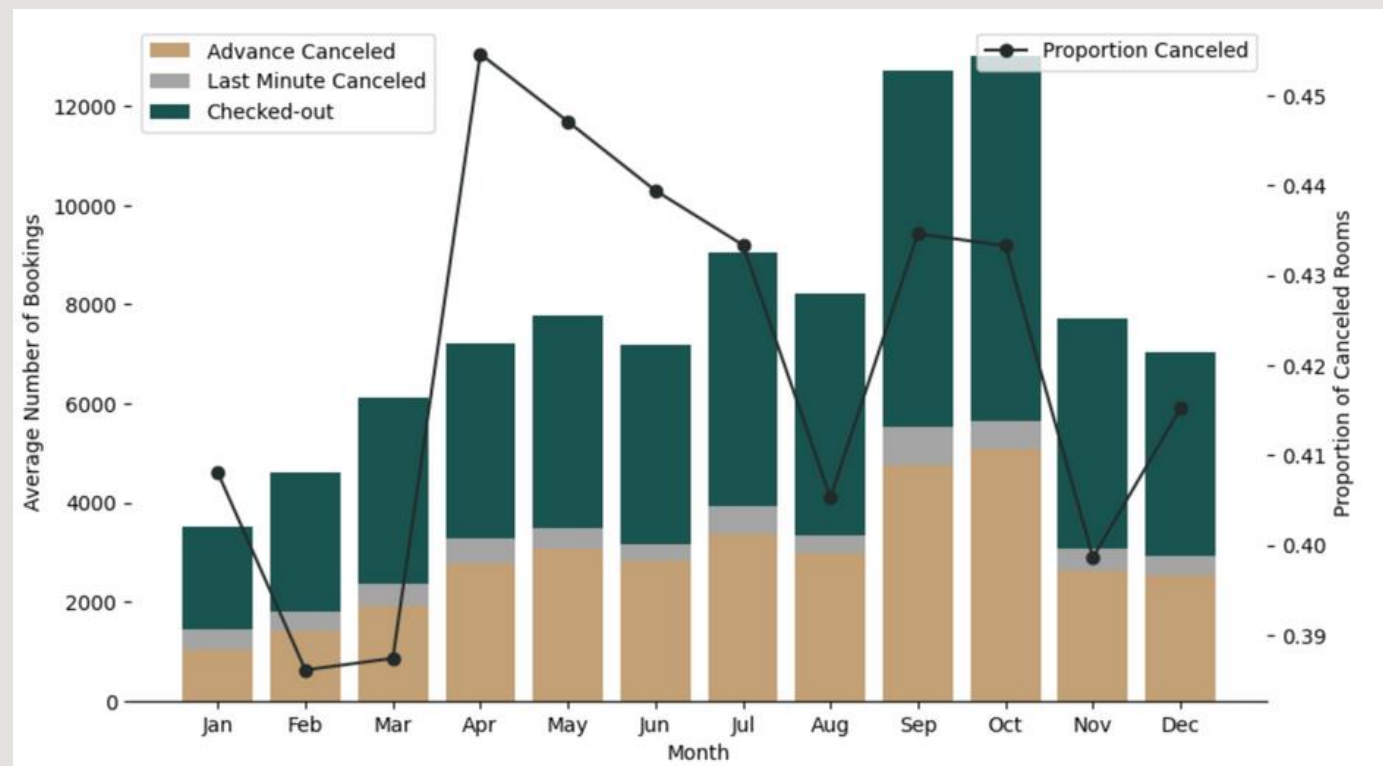
Month



Cancellation Policy

FACTORS INFLUENCING CANCELLATION

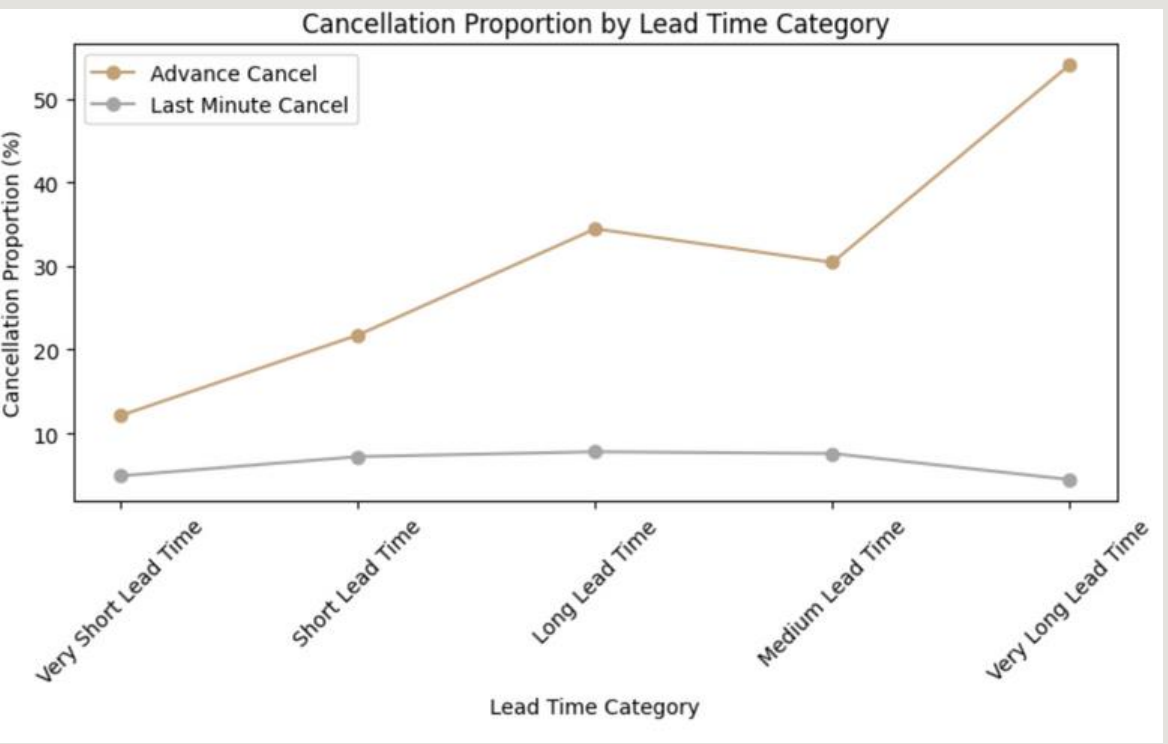
A. Timing



Canceled proportion

April-June
has the highest proportion
of cancellations.

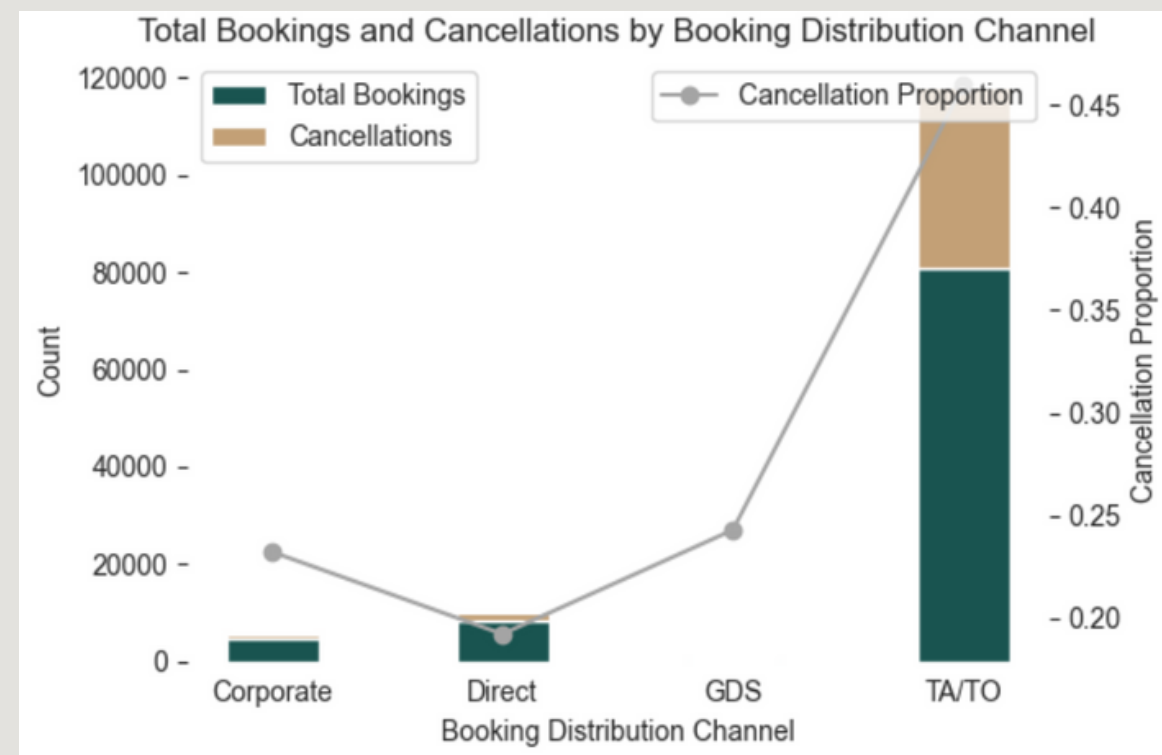
↑ Lead Time
Longer Lead times leads to
higher advance cancellations.



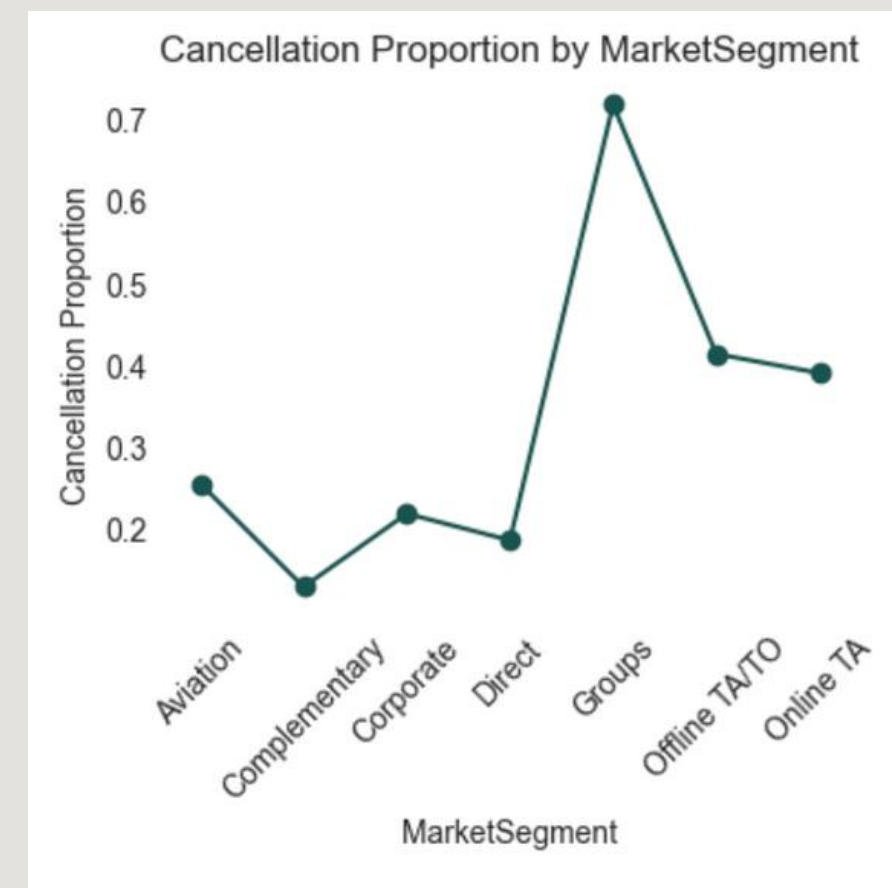
Lead Time proportion

FACTORS INFLUENCING CANCELLATION

B. Market Segment



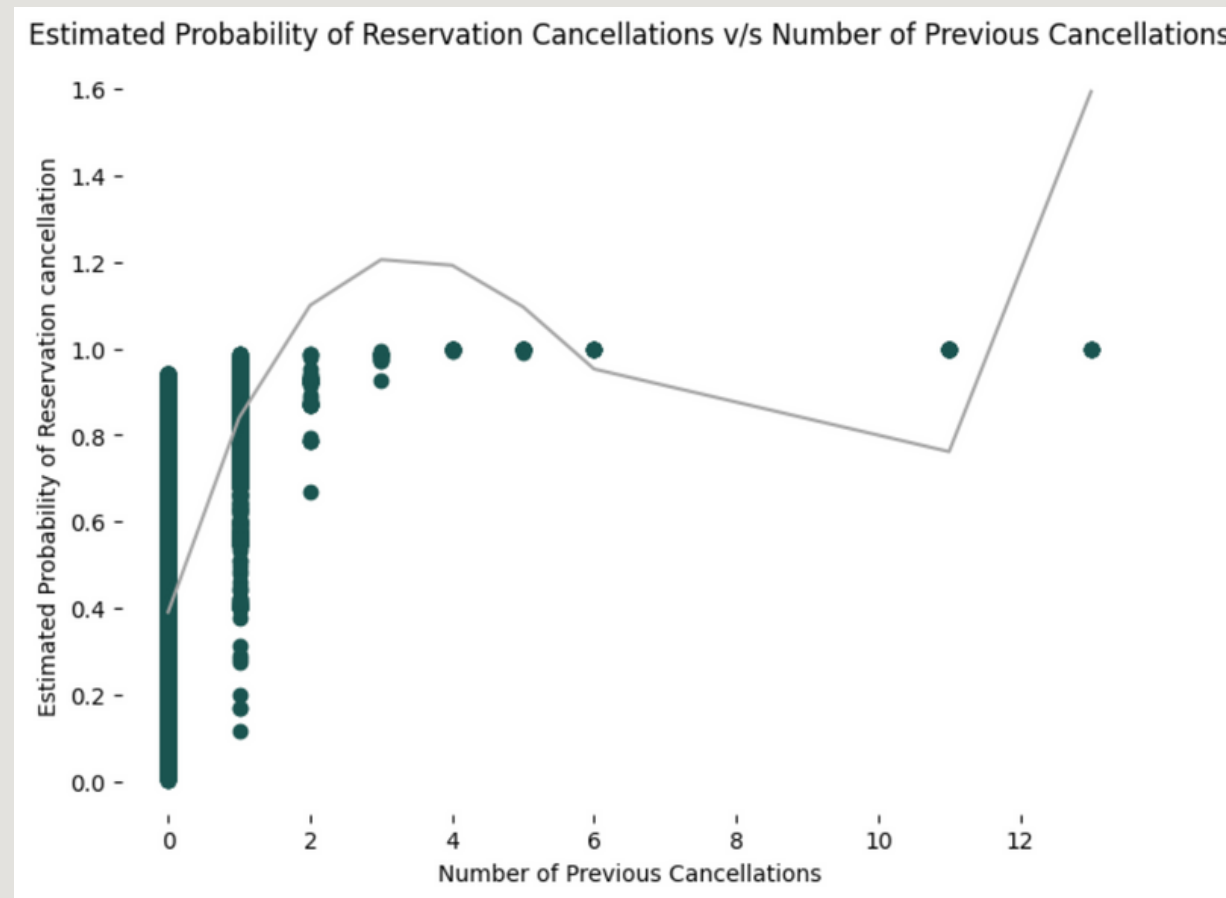
BDC Cancellations



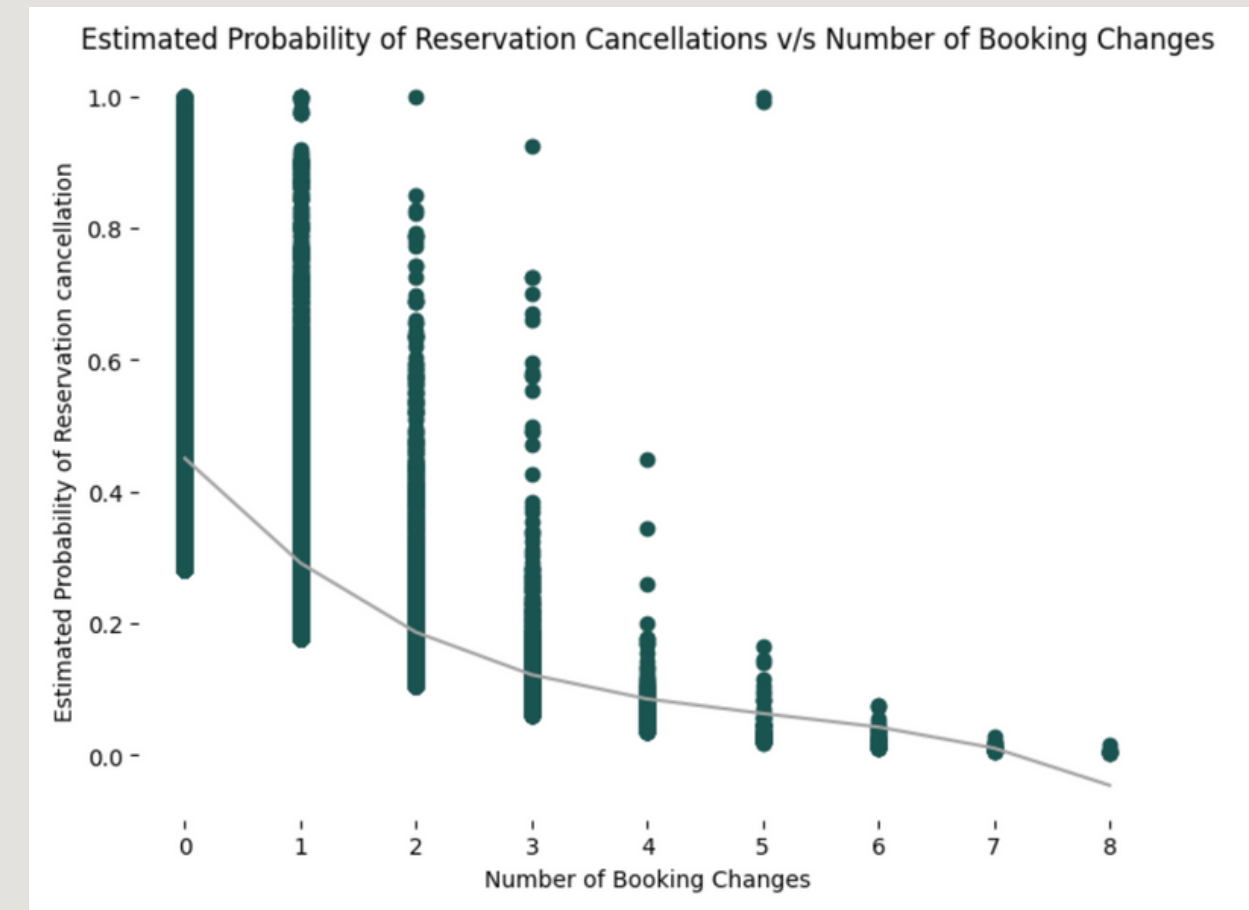
Market Segment Cancellations

FACTORS INFLUENCING CANCELLATION

C. Customer



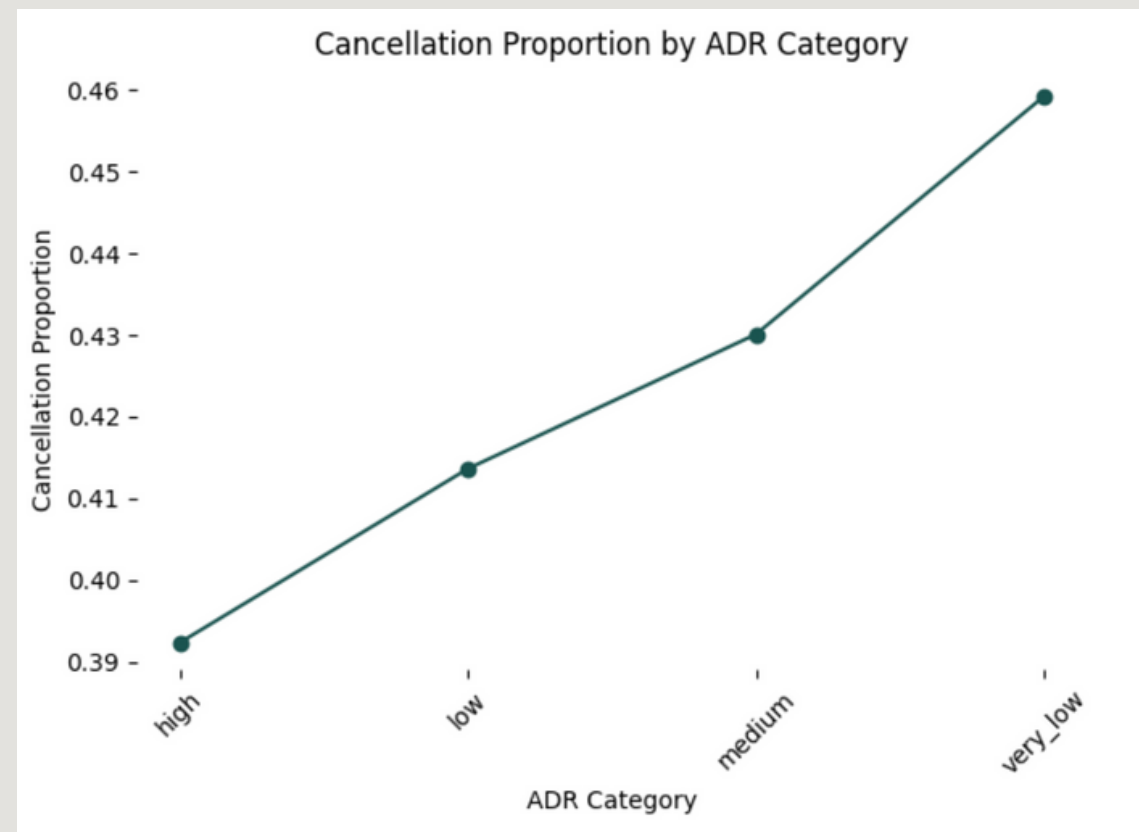
Previous cancellation Analysis



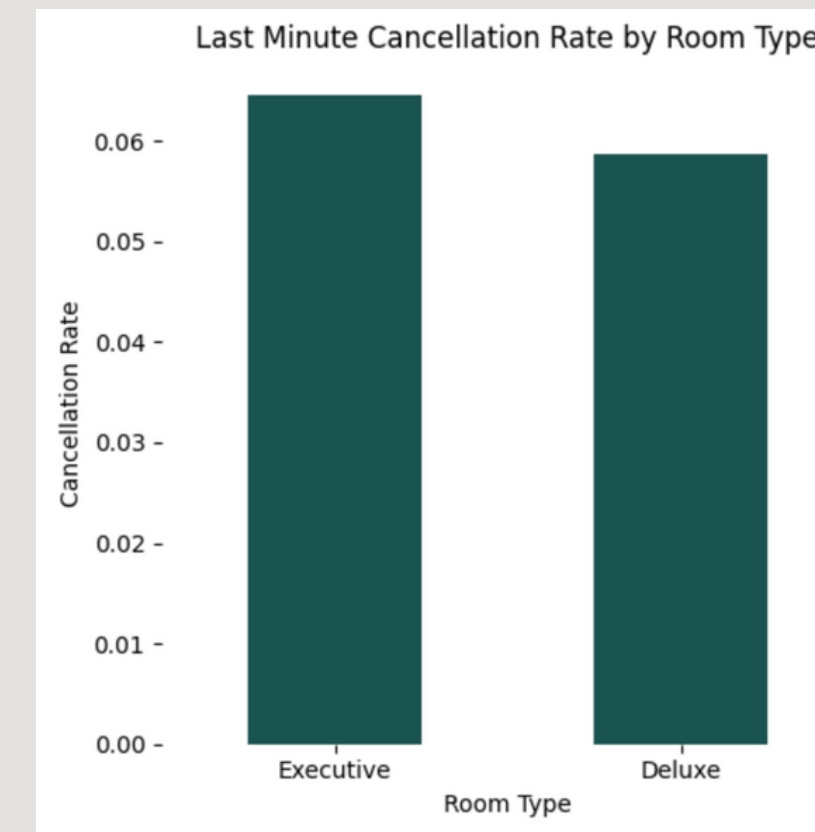
Booking changes v/s cancellations

FACTORS INFLUENCING CANCELLATION

D. Money

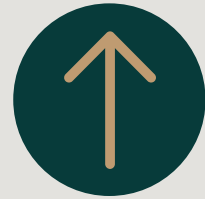


ADR Category Cancellations



Last Minute Cancellations v/s RoomType

OUR RECOMMENDATIONS



NON-REFUNDABLE RATES

Introduce more Non-refundable rates, offering a 10-20% discount from April to June.



VOUCHERS

For customers with refundable deposits, who cancel last minute, GHR can return that deposit as a voucher.



ADDITIONAL FIXED FEE

For bookings with longer length of stays, and customers seeking a fully refundable option for advance cancellations.



RE-NEGOTIATE CONTRACTS

To address the surge in OTA cancellations, GHR should re-negotiate contracts with high-cancellation booking companies.



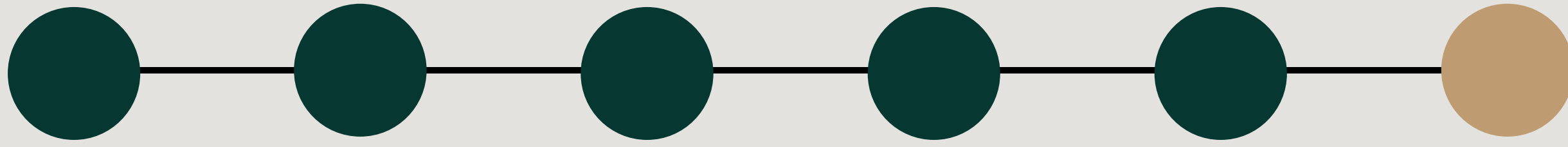
PHASED DEPOSIT SYSTEM

For group bookings, Implement Phased deposit system starting with a small deposit & followed by incremental payments closer to the arrival date.



LOYALTY POINT SYSTEM

Guests earn points with each successful booking, redeemable for future stays.

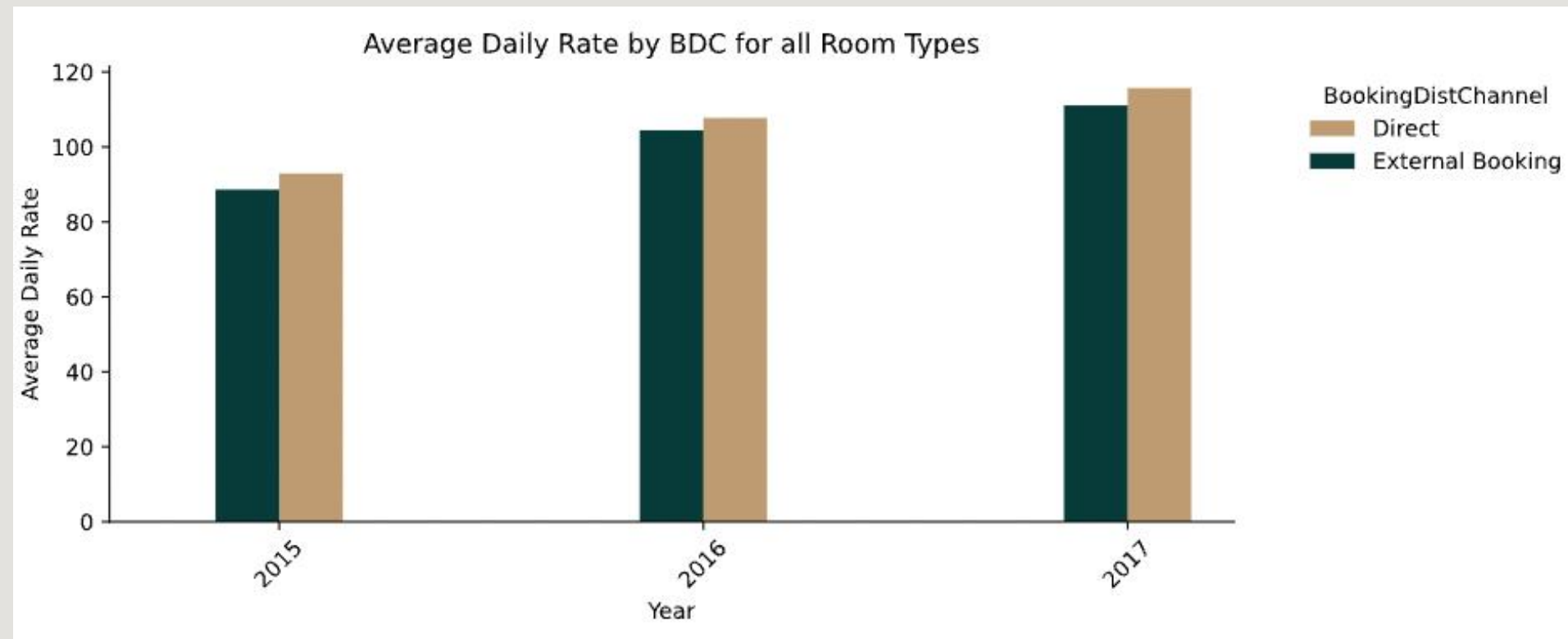


**Maximizing
Potential Revenue**

REFINING ADR



STRATEGY



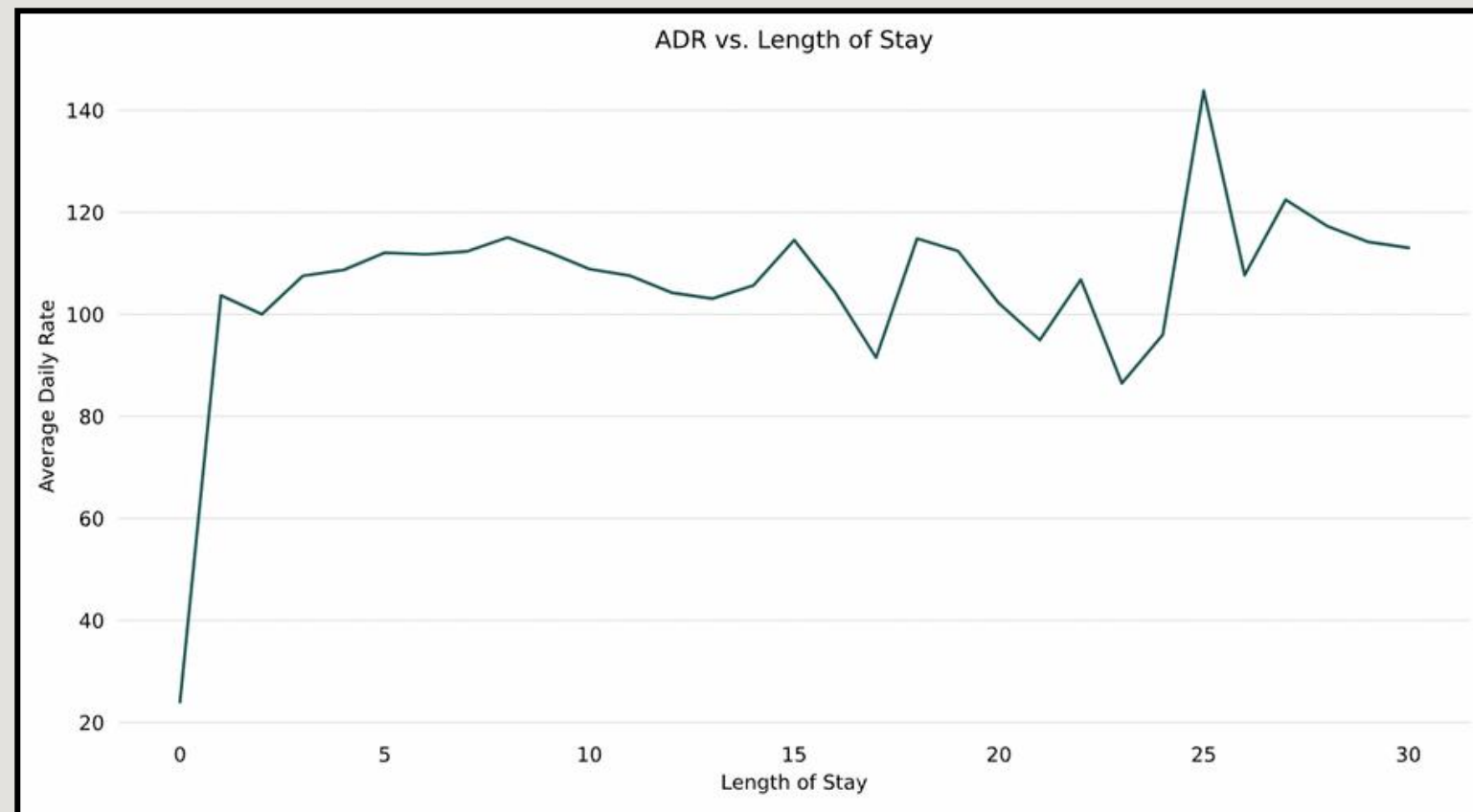
Rate Parity Analysis

Take advantage of recent change to Portuguese competition law & lower direct booking prices.

IMPROVING ROOM OCCUPANCY



STRATEGY



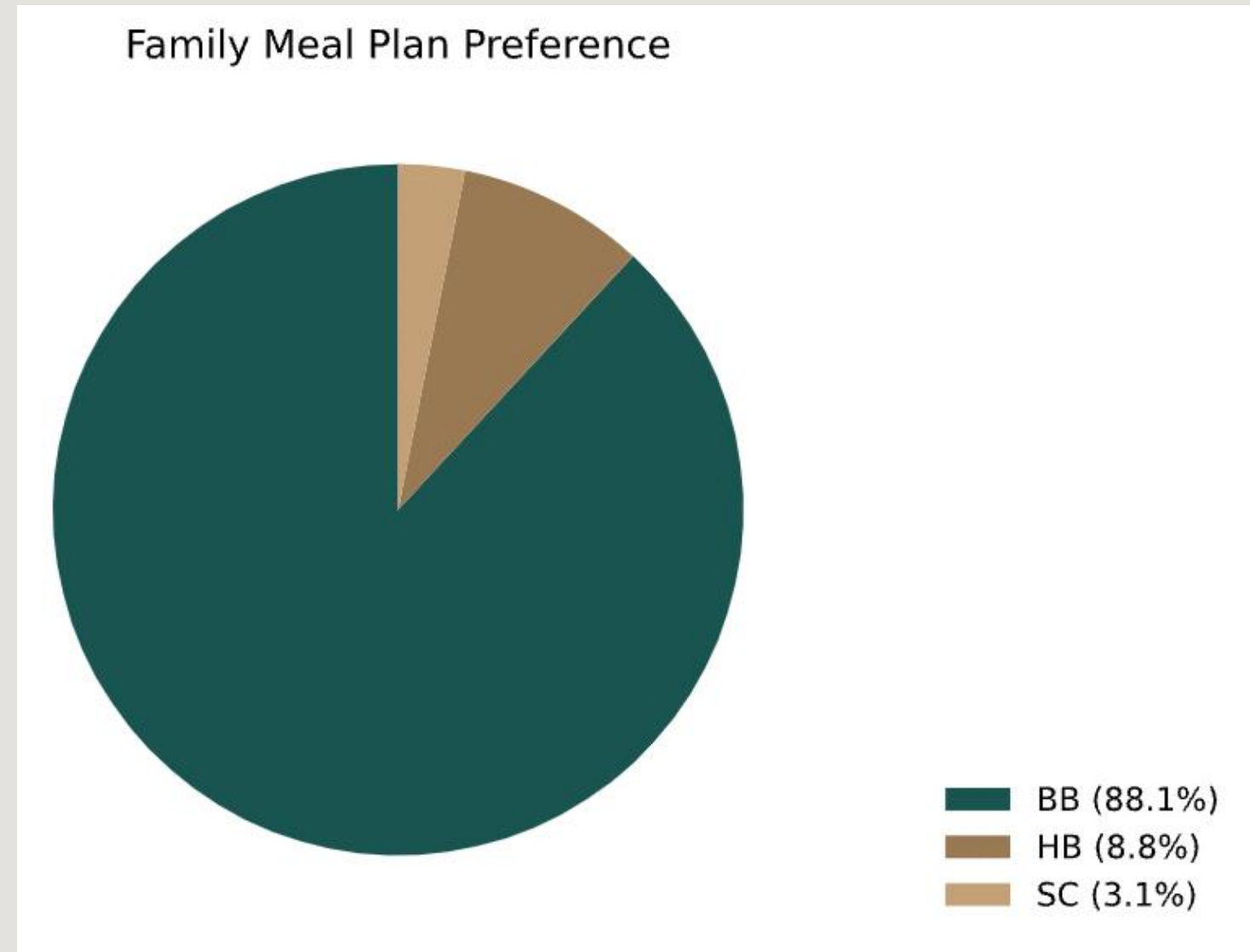
Length of stay analysis

Partner with local events, and offer discounted passes along with the room rates.

IMPROVE RESOURCE PLANNING



STRATEGY



Family meal plan analysis

Offer discounted meal plans for families which will be a compelling option, offering them convenience of pre booked meals.

Thank you!

For
checking in
on our
findings

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