HOTEL
CHAIN C
FORECASTING MODEL

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WHAT EXPECT OF TODAY

CONTEXT
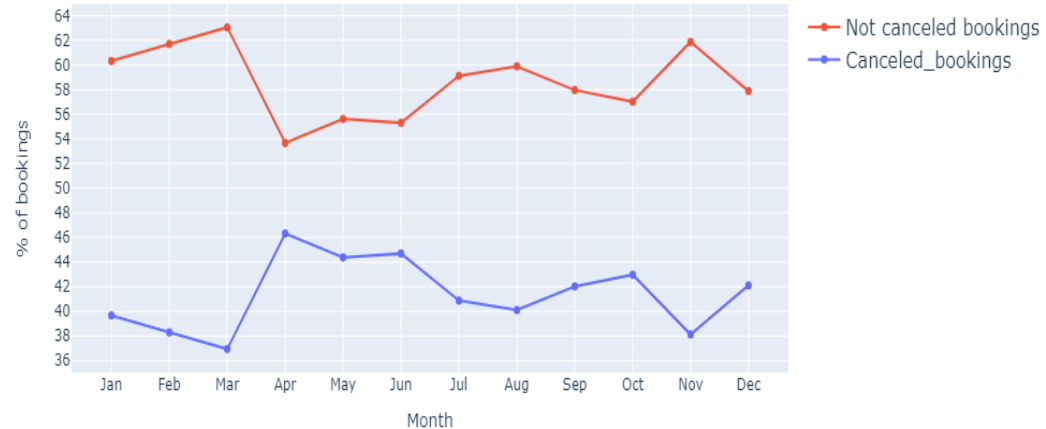
BUSINESS UNDERSTANDING

CLASSIFICATION MODEL

FORECASTING

RESULTS

IMPROVEMENTS

CONTEXT

- Hotel Chain C suffers from numerous cancellations.

- Lost more then 10 Mi Euros

- Goal to implement prediction models to forecast net demand on reservations

- **Reduce in 20% the cancellations**

328,83 €
Lost/
Cancellation

311,38 €
Gain/
Room
Revenue

BUSINESS UNDERSTANDING

| Business Objectives	Data Mining Goals	Success Criteria
Implement a predictive model to classify the reservations of the hotel	Apply a classification algorithm to identify the booking cancellations.	Evaluation of 90% of the classification model
Identify the probability of Booking with high likelikood of cancelling	Implement a forecast algorithm to predict the booking goals	Evaluation of 80% in forecasting model

DECREASE IN 20% THE FUTURE BOOKING CANCEL

CLASSIFICATION MODEL
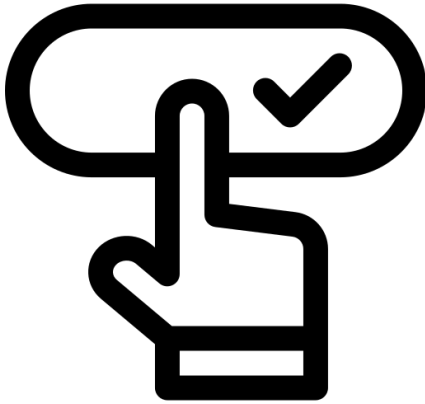
- Classify the H2 cancelling customers based on they profile;

- Random Forest – Machine Learning method
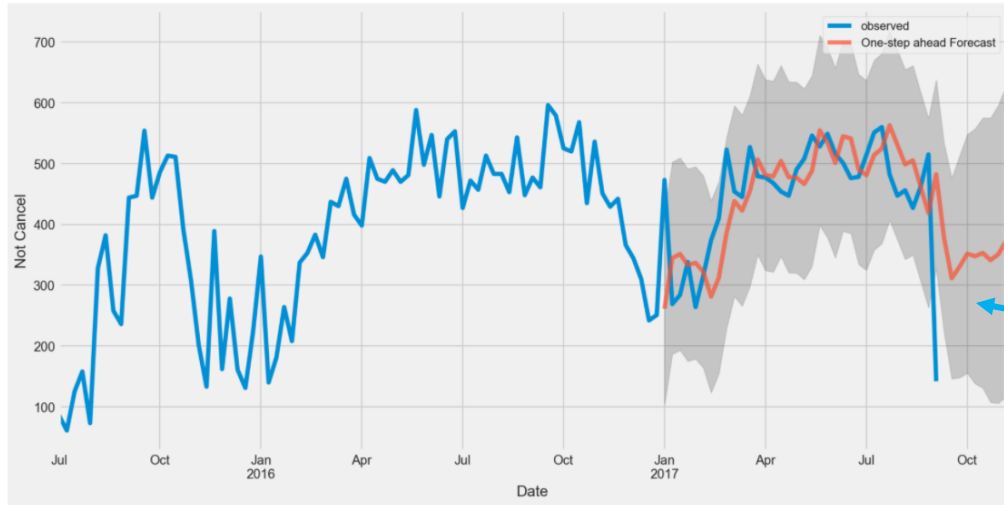
CLASSIFICATION MODEL
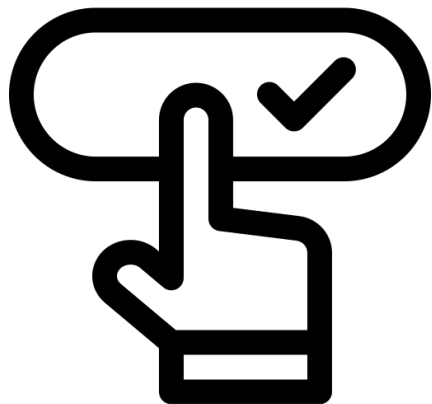
Training Results

| Model	precision	recall	F1	accuracy
Random Forest + unbalanced dataset + default hyperparameter	0.87 (0): 0.86 (1): 0.88	0.86 (0): 0.92 (1): 0.79	0.86 (0): 0.89 (1): 0.83	0.93
Random Forest + SMOTE-NC + Features Selection + default hyperparameter	0.86 (0): 0.87 (1): 0.86	0.85 (0): 0.91 (1): 0.80	0.86 (0) :0.89 (1): 0.83	0.93
Random Forest + SMOTE-NC + Features Selection + RandomizedSearch	0.86	0.84	0.85	0.93

Testing Results

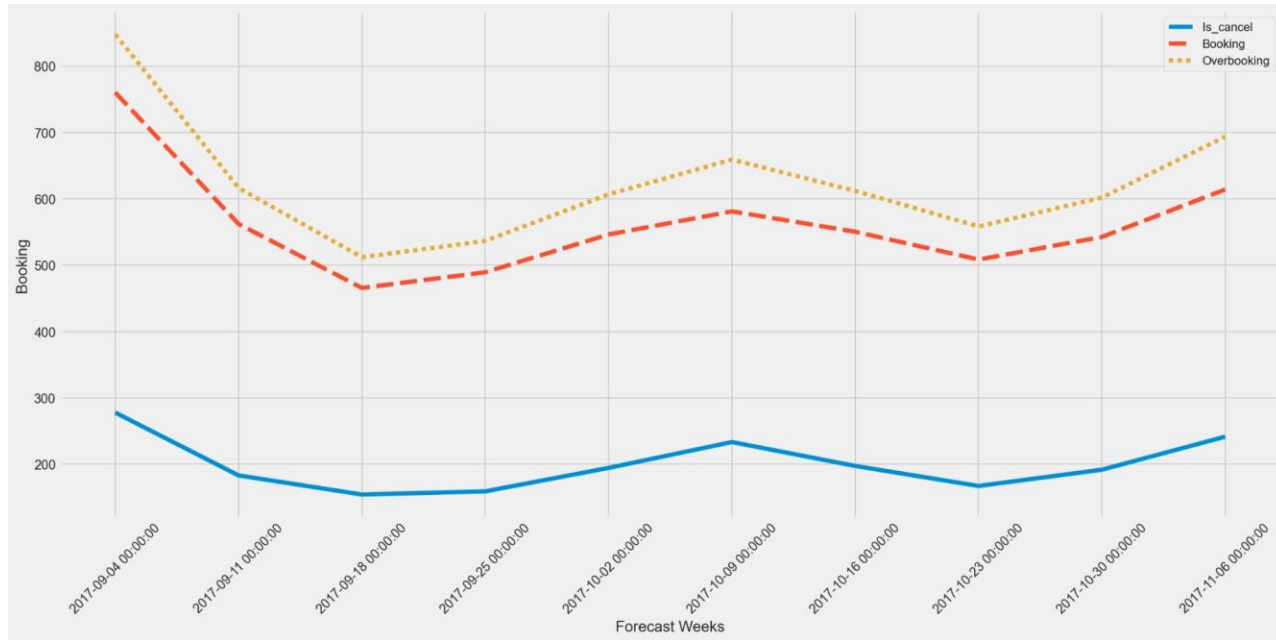| Model	precision	recall	F1	accuracy
Random Forest + SMOTE-NC +Features Selection + default hyperparameter	0.86	0.85	0.86	0.93

FORECASTING

Canceled Bookings

Confirmed Bookings
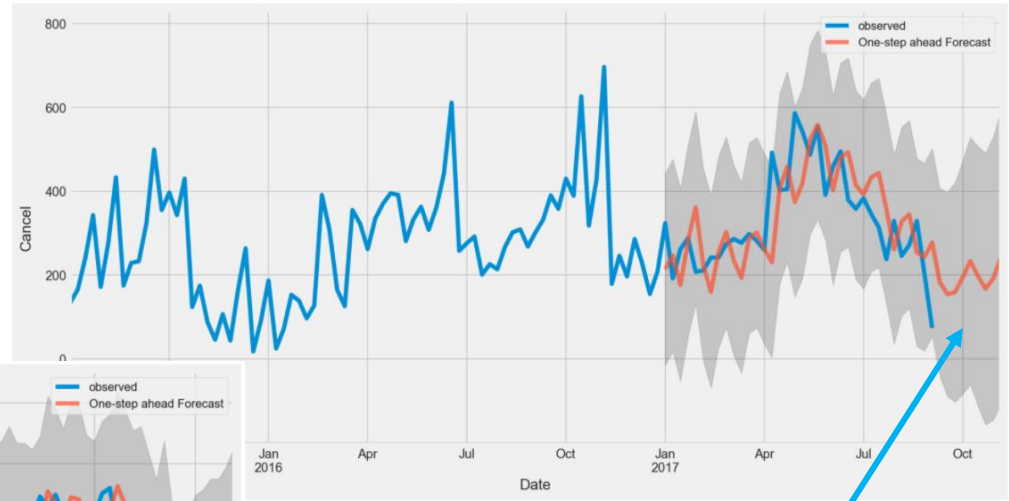
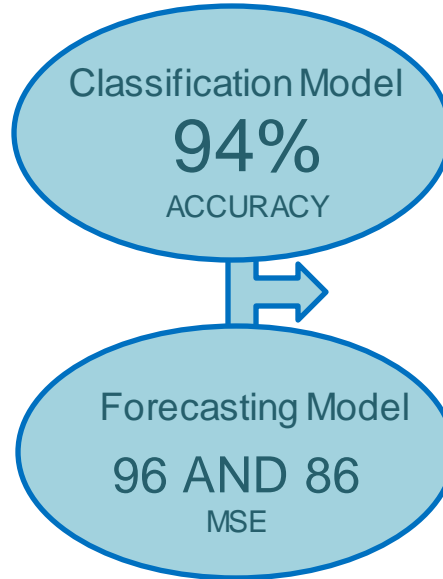Forecasting of the next
10 weeks

FORECASTING

RESULTS

Business Objectives

Implement a predictive model to classify future reservations of the hotel

+

Predict the number of cancellation per season

Classification Model
94%
ACCURACY

Forecasting Model
96 AND 86
MSE

Success Criteria

GOAL OF BOOKINGS TO REDUCE 20% OF CANCELLING

IMPROVEMENTS

- Define the probability for the Hotel's capacity is overpast

- Forecast the number of Customers not showing up and combine this with previous analysis

$$\binom{k-1}{r-1} p^r (1-p)^{k-r}$$

THANK YOU