Business Case #2

Hotel Booking Cancellations

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NOVA Information Management School – Business Cases with Data Science (Spring 2020/2021)

General context

- **Bookings** are a forward contract between the hotel and the customer with a cancellation option;

- The hotel suffers a **great risk** as there is a possibility the customer cancels the booking;

- If a cancellation happens near the booking date, the hotel might **not have time to sell the room**, or they will have to sell it at a **discounted price**;

General context

- Cancellations occur for various reasons;

- **"Deal-seeking" customers** tend to make multiple bookings for the same trip in order to find the best deal;

- The number of "deal-seeking" customers has grown immensely with the appearance of **Online Travel Agencies (OTAs)**;

- OTAs have improved exposure but also **increased competition**;

General context

- There is generally two approaches to fight cancellations: **overbooking** and **restrictive cancellation policies**;

- **Overbooking problems:**
  - Customer reallocation costs and trust loss
  - Social reputation damage

- **Restrictive cancellation policy problems:**
  - Decrease in demand
  - Decrease in revenue (need to sell cancelled rooms at discounted price)

Business situation

- Hotel chain C, a chain with resort and city hotels in Portugal was severely impacted by cancellations, representing almost **28% in H1** and almost **42% in H2**;

Hotel	Metric	Not Canceled	Canceled	Total
H1	Bookings	28,938 (72.2%)	11,122 (27.8%)	40,060 (100%)
	Room Revenue	11,601,850€ (66.5%)	5,842,177€ (33.5%)	17,444,028€ (100%)
H2	Bookings	46,228 (58.3%)	33,102 (41.7%)	79,330 (100%)
	Room Revenue	14,394,410€ (56.9%)	10,885,060€ (43.1%)	25,279,470€ (100%)

Business situation

- Michael, Revenue Manager Director of hotel chain C, has already implement several approaches to reduce the cancellations, **with no significant improvement**;

- A consultant was hired to evaluate the possibility of developing predictive models to **predict the net demand** for their hotels, specifically in a city hotel (H2);

- The hotel provided the consultant a dataset with the **bookings made in that hotel**, which were due to arrive between July 1, 2015, and August 31, 2017;

Business situation

- Michael wants to implement prediction models to allow the chain's hotels to **forecast net demand based on reservations on-the-books**;

- Michael expects to implement **better pricing and overbooking policies** with these models;

- Identifying high cancellation likelihood bookings **allows C to act preventively**;

- Michael's goal is to **reduce cancellations to a rate of 20%**;

Business situation

- The dataset comes with some **metadata**, available in the associated README.md file;

- **Expected outcomes**:
  - Explore the data and build a model to predict cancellations:
    - Define a machine learning success criteria;
    - Select an appropriate algorithm;
  - Elaborate on the business implications of employing the model and the insights obtained from model development;
  - Make suggestions how could the model be deployed and its impact on the hotel's business processes;