Centre for Operations Excellence

Modelling appointment reliability

Training & Professional Services is a Boeing group that provides flight training programs and maintenance training programs to external customers and internal personnel at various locations across the world. Training programs include classroom time, computer-based training and full-flight simulator (FFS) sessions. Training programs have different target start dates, durations, and priorities.

Problem and Opportunity

Training & Professional Services faces competing objectives: maintaining high resource utilization, but ensuring high service level for high-priority bookings, while also generating revenue. Currently, Training & Professional Services is facing very high demand for the FFS sessions. However, last-minute rescheduling and cancellations result in costly idle time on the flight simulators, as well as more scheduling work. Training & Professional Services wishes to identify factors that would enable them to assess the reliability of the bookings. This would help better predict cancellations in advance and manage the schedule more effectively.

Approach and Solution

To gain insight into the factors affecting the reliability of the different bookings, the first step was to investigate individual training program bookings. A subset of data was selected to include complete histories of booked training programs and all of their respective changes, and these booking changes were then summarized. There were two fundamentally different types of training program bookings which were summarized based on two different change behaviour metrics that were developed. Significant factors affecting change behaviour metrics were identified using statistical tools.

Investigating individual TPs → Summarizing TP changes → Recognizing significant factors → Categorizing TPs → Testing policies

In the next step, a conditional inference tree was used to categorize training programs. This approach took the previously-identified significant factors as the input and found the meaningfully different categories of training programs based on the changes made to them. Reliability of a booking is the likelihood that the booking remains unchanged until its start date, and this reliability changes with time. After categorizing training programs, the reliability of a booking in each category on any future day was estimated.
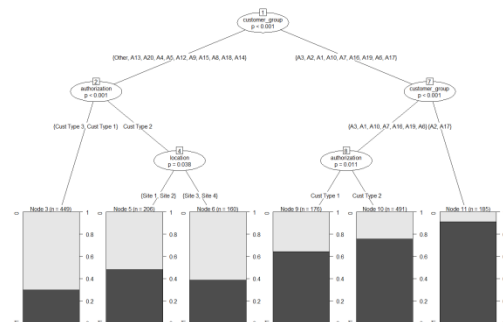
Benefits to Client

Training & Professional Services could set different schedule confirmation dates for training programs in different categories based on the reliability of these categories. In addition, schedulers could systematically prioritize training program bookings that are competing for the same time slot in the schedule. Training program bookings with low reliability at a certain time could represent opportunities for overbooking. Overbookings could also be reassessed and modified regularly as the reliability of bookings changes with time.