IMPROVING THE CHECK-IN PROCESSES OF AN AIRLINE COMPANY IN AN AIRPORT TERMINAL

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ABSTRACT

This case study consisted in the analysis and improvement of Iberia's check-in processes in the Adolfo Suárez-Madrid airport T4-terminal. A simulation model was developed on Simio for this purpose and different alternatives were analyzed. This study was carried out by baobab soluciones.

1 INTRODUCTION

Airlines are concerned about the quality of service offered to their customers and waiting times at the check-in desks are a matter of major importance. This was Iberia's concern when baobab soluciones contacted them.

The project was kicked-off in anticipation of a growth in demand (which was eventually delayed by the COVID-19 pandemic) and a change in the renting fees of different resources (regular check-in desks, auto check-in kiosks, etc.). Iberia's goal was to be ready to modify its check-in processes as soon as the changes materialized.

2 PROBLEM DESCRIPTION

When passengers arrive at the terminal they can follow different directions before entering the boarding area: some will go directly to the security check while others will go to the check-in area, where they will use either a regular check-in desk or an auto check-in kiosk, and then head towards the luggage drop-off belt, if they carry any.

Passengers arrive at different times depending on their profile (families, business people, etc.) and their flight. They also have different preferences when they are offered different check-in options.

Iberia can allocate different amounts of resources (namely desks and kiosks) and set different check-in rules (encouraging the use of auto check-in kiosks for some flights or even imposing its use for others, for example) during the day. As a result of these decisions, the passengers' waiting times may vary. Therefore Iberia needs to balance the obvious trade-off between their cost and the quality of service passengers receive.

3 SIMULATION MODEL

baobab soluciones developed a simulation model on Simio that used information on flight arrivals, passengers arrivals and passengers check-in preferences as input data. Future demand scenarios were developed from Iberia's historical data and future growth forecasts.

In order to meet Iberia's interests, the model could be configured to analyze different configurations where the number of desks and kiosks and the assignment of check-in resources to flights and passengers could be changed.

The simulation time was one week and the output information was exported and analyzed in detail to characterize waiting times in 1-hour intervals, as daily averages can hide poor performance at some specific moments. Other output analyzed were the number of passengers attended per desk and kiosk, the utilization rate per check-in resource and the total operation cost, which in turn depends on the number of desks and kiosks used and the renting model for each one (renting 24x7 vs. renting per hours).
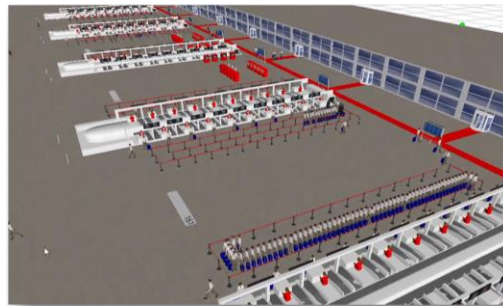

Figure 1: Model interface.

4   ANALYSIS

Different capacity analysis were conducted with different demand patterns, number of resources and check-in rules. For example, the image below shows how for a given initial configuration labeled as *i*, six alternatives were evaluated, each adding some desks over the previous one. Iberia could compare among these alternatives and choose the right amount of desks that guarantee that their passengers will not wait long and that the desk utilization remained within acceptable limits, while taking into account the associated cost.
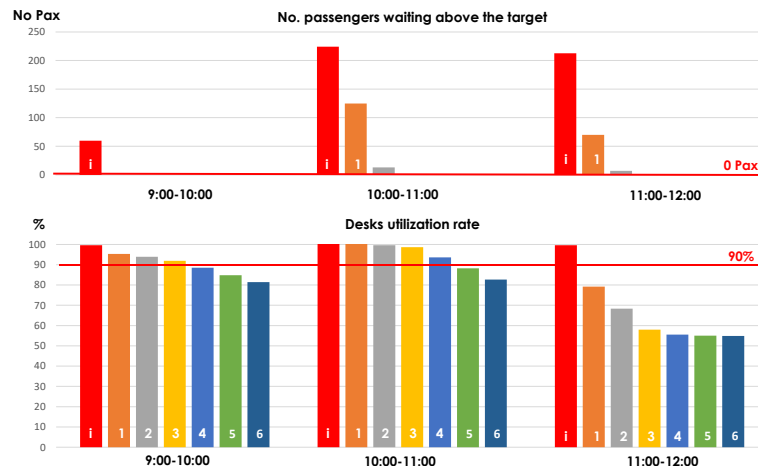

Figure 2: Model results.

5   CONCLUSION

The model developed was able to represent the complexity and the randomness of the system (randomness in passengers arrival, passengers check-in preferences and check-in times). Moreover, it was a proper tool to evaluate and compare changes in the real system without interfering in its daily operation and without incurring investments in equipment. Furthermore, it could be extended to evaluate the purchase of new check-in equipment in a future, such as self-bag-drop machines.