

Case Study

# AltexSoft and Key Data Dashboard:

Advancing a Business Intelligence Tool with AI

Python, Keras, and TensorFlow 2.1 (for the algorithms), Flask microservices, and Databricks schedulers



# Background

Key Data Dashboard is a US-based business intelligence company that provides performance data insights for small- and medium-size vacation rentals. Its goal is to collect, analyze, and visualize the data from property management systems (PMSs) by locations and provide tourism and destination marketing organizations (DMOs) with the best, most up-to-date information about their main KPIs. The client works in partnership with over 700 property management systems, tourism groups, and DMOs in the US.

Key Data Dashboard reached out to AltexSoft to enhance their tool with several AI-driven features. These features are aimed at more precisely analyzing key hospitality KPIs like Occupancy Rate, RevPAR, Average Daily Rate, etc.



# Challenges

Our team faced the following challenges:

**1.**

Improve property performance comparison by locations

**2.**

Develop an Occupancy Rate forecasting feature

**3.**

Make the KPI data in unknown locations more accurate

# Value Delivered

## 1. Enhanced comparison of properties' performance

One of our goals was to improve the performance analysis so that a user could compare the average performance of vacation rentals in similar locations. To complete this task, we applied a content-based filtering machine learning algorithm trained using unsupervised learning. As a result, it became possible to compare the performance of rentals in similar locations by key KPIs.

## 2. Introduced the occupancy rate predictions

Based on historical data, this feature allows predicting Occupancy Rate in rentals in different areas for an upcoming month. To enable this functionality, our data scientist applied a CNN-based time-series model, trained on historical data with 120,000 series for properties and 20,000 series for areas.

## 3. Improved occupancy data accuracy

As the client data doesn't cover the entire US geographically, they must take this data from their partners. However, this data is not precise, as there is no information about the rentals temporarily closed. To solve this problem, our data scientist created a model that makes the Occupancy Rate data more accurate. Based on information from the nearest areas, where a client has data from the PMSs, the k-nearest neighbors algorithm calculates Occupancy Rate, reducing inaccuracy up to 16 percent. The same feature for the Average Daily Rate is also available.

# Approach and Technical Info

The project's scope was **10 man-months**. It was completed by one **Data Scientist**.

The technology stack of the project included **Python, Keras, and TensorFlow 2.1** (for the algorithms), **Flask microservices**, and **Databricks schedulers**. The machine learning approaches included **unsupervised training, content-based filtering algorithm, k-nearest neighbors algorithm, and CNN-based time-series model**.

The cooperation between the client and AltexSoft is ongoing.

# AltexSoft and Key Data Dashboard

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