AIR FRANCE-KLM

GUIDANCE ON THE DEFINITION AND DEVELOPMENT OF THE KARMA REVENUE MANAGEMENT APPLICATION ENGINE

Aim:
to design a new shared revenue management tool engine for the AIR FRANCE-KLM Group

Solution:
development of a decision support application with Big Data architecture

Results:
- AIR FRANCE and KLM harmonized their revenue management practices
- excellent reception from the revenue management analysts
- positive impact on the group's unit revenue[1]

"The EURODECISION teams' dual Optimization and Development profile (in C++, Hadoop) makes them receptive to KARMA's algorithmic complexity. Furthermore, they are aware of the tool's purpose and we can be sure they will set up relevant indicators and come up with an enlightened analysis of the results obtained." Mohand Ait Alamara, Manager OR/PRM domain

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"The EURODECISION experts are full members of the project team working on the KARMA engine. They were in on the analysis from the outset, contributed to setting the priorities and came up with proposals including the choice of architecture." Antoine Winckels, KARMA Project Manager

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All airlines practise revenue management. It is a strategic and differentiating issue in this highly competitive sector, involving maximizing revenues by controlling capacity and managing fare classes.

Harmonizing revenue management systems soon became essential after AIR FRANCE and KLM merged in 2004. A project to develop a common tool was launched in 2008, as proprietary software is hard to tailor to the specifics of major airlines (besides, the AFKLM network is unusual in that it has two hubs).

The AFKLM Operational Research Department was tasked with the intricate task of defining a new revenue management tool engine, while other departments took on HMI development and data collection to feed it.

It was clear from the specification phase that the project would be extensive. Apart from the difficulty of reconciling the two airlines' management practices... KLM worked with an "Origin-Destination" parameter (e.g.: Nice-New York) while AIR FRANCE configured using the notion of "leg" (e.g.: by differentiating between the Nice-Paris and Paris-New York legs), AFKLM had to develop its first Big Data application with architecture capable of processing large volumes of data. Having to include the whole network, short- and long-haul flights, implying a high combinatorics, made the modeling extremely complex. It was hard to find the right level to aggregate the data intelligently and make the forecasts reliable.

EURODECISION was involved from project kick-off day as the Operational Research Department's strategic partner. Its experts are recognized for their twofold capability – optimization and Data Science (forecasts and statistics) – as well as their strong grasp of the business. On the strength of their expertise they provided support to AIR FRANCE-KLM for organizing the millions of data items captured and estimating future demand to calculate a floor pricing per fare class.

An initial KARMA[2] application batch was delivered in 2014, after 6 years of intense work which took up the time of a dozen individuals. One of the major features of the tool is demand forecasting along with cancellation and no-show forecasting. The solution devised is a true decision-making tool that was extremely well received by the group's 200 revenue management analysts. They now use it every day to optimize the load of each aircraft.

Since KARMA was launched, AIR FRANCE-KLM's Department of Operational Research and EURODECISION have continued to upgrade the application by making improvements and by introducing additional features to cater for specific instances. Purpose-designed studies are conducted in conjunction with the Client: once the requirements have been identified, POCs and prototypes are developed to decide whether or not to integrate them into the application.

Although it is hard to gauge the gains made by KARMA, the impact on the AIR FRANCE-KLM group's unit revenue is very positive and the airline has decided to continue investing in this application. Besides, by enabling AIR FRANCE and KLM to converge to a unified revenue management process, and in a context where many tools remain distinct between the two entities, the KARMA joint project is a real success.

[1] *unit revenue: revenue for an available seat or for a paying passenger transported over a kilometer*

[2] *KLM AIR FRANCE Revenue Management Application*

AIR FRANCE-KLM – key figures (2016 data):

1,800 daily flights
100 million trips analyzed per annum

77 million passengers per annum
210,000 bookings per day