



## CASE STUDY

# Innovative airline revenue management forecasting gives SAS **30%** enhanced accuracy

Scandinavian Airlines (SAS) is one of the first airlines to benefit from a new Amadeus revenue management forecast model – Active Forecast Adjustment (AFA), which helps airlines adapt their revenue management systems to fluctuating air travel demand.

Revenue management systems (RMS) have tended to rely heavily on historical data to create forecast models – however, the crisis suddenly made the historical data irrelevant. With such drastic changes, it may appear that the RMS demand forecaster would need to essentially start from a blank slate.

Fortunately, Amadeus' demand forecast already uses live sales data from non-departed flights, and as such, adjusts demand

levels automatically as airlines resume operations. However, in the current situation, which holds significant uncertainty about future customer demand, airlines need a forecast to capture the most up-to-date demand patterns based on as little as a few months' worth of live sales data. To overcome this challenge, Amadeus' revenue management research team has developed a novel demand forecaster called AFA, which can quickly adapt to changes in market demand.



## What is AFA?

The pandemic has led to months of abnormal booking and cancellation behavior, to the detriment of the historical database. This has led to freezing the post-departure history to ensure a stable forecast based on the pre-pandemic data. This approach has allowed revenue management analysts to control their flights using interventions. Therefore, the principle behind AFA is to create a feedback loop where the forecast error (actual bookings – expected bookings) on the live sales data is constantly monitored, and adjustments are applied to minimize forecast errors. AFA automatically adjusts forecasts across all departure dates based on the latest market level live sales data.

## What is new about AFA in airline revenue management?

The novelty of AFA is that it separates the components of the demand forecast into two categories, depending on whether they are likely to be resilient or volatile during the recovery period. For example, seasonal demand variations and day-of-week demand patterns are considered largely resilient, while total demand volume, booking curves, and customer willingness-to-pay are expected to be volatile. Targeting only the volatile components with AFA enables RM analysts to reduce the complexity, making it possible to adjust these components using the most recent sales data to maximize forecast accuracy.



*Our personal involvement right from the beginning of the pilot, coupled with innovative technology, clear alignment, and open dialogue with Amadeus, has helped us achieve positive results in forecast accuracy, which have influenced our bottom line. We were the first to test Amadeus' AFA, and we've seen very positive results thus far.*



**Erik Winter, Team Leader Revenue Management Systems, SAS**





## The AFA project with Scandinavian Airlines

Amadeus launched a revenue management project during the pandemic, which resulted in a new revenue forecast model – Active Forecast Adjustment (AFA). Amadeus conducted a pilot with the airline to help its revenue management system address fluctuating air travel demand. The objective of this project was to forecast adaptivity while retaining robustness and stability, especially in times of pandemic recovery.

### Key results

This project represents a huge step in helping airlines adapt their revenue management systems to fluctuating air travel demand for effective business recovery. Scandinavian Airlines has taken a proactive approach by working with Amadeus to adapt to market changes, accelerating the airline's path to recovery. This is reflected in the results and achievements outlined here.

#### KPIs



**922**

origin & destination routes analyzed by AFA



**91%**

of SAS' total flight demand covered by these routes



**30%**

estimated forecast accuracy improvement from COVID-19 baseline



**1%**

estimated revenue improvement



*SAS has been using Amadeus Revenue Management technology for many years. It's the best on the market and has been a worthwhile investment. Thus, during the pandemic, Amadeus was able to quickly adapt to our new circumstances. If we didn't have AFA, the forecast would be off – AFA enabled us to deliver around 30% increase in forecast accuracy based on the COVID-19 baseline.*

**Erik Westman, Vice President, Revenue Management, SAS**



### Is AFA only valuable during the pandemic recovery period?

Amadeus RM scientists' research indicates that the AFA holds considerable value beyond the pandemic recovery period. Even after they have collected enough clean data to "unfreeze" the estimation of forecast parameters, AFA can still be used to ensure rapid reaction to market changes, increasing forecast adaptivity while retaining robustness and stability. One of our research papers indicated that even a 10% increase in forecast accuracy can lead to a 1% gain in revenue – therefore, AFA holds significant revenue potential for airlines.



*In the long term, we expect numbers to even out to a 10-15% increase in forecast accuracy, which is around 1% increase in total revenue. So we've seen some positive results already, and we expect more once bookings become more stable over time. In the long run, the increased automation we are gaining will allow us to manage resources to create impact elsewhere in the organization.*



**Erik Winter, Team Leader Revenue Management Systems, SAS**

## Vision for the future of Revenue Management

Scandinavian Airlines has been a frontrunner in airline revenue management since the early 1990s. Through the partnership with Amadeus, the airline deployed the most advanced revenue management technology, including the new revenue forecast model (AFA), helping airlines adapt their revenue management systems to fluctuating air travel demand.



*The upheaval caused by the COVID-19 pandemic has rocked the very foundation of airline industry revenue management forecasting. Together with Amadeus, we are fine-tuning what we already know to be a competitive advancement with the Amadeus RMS and taking advantage of low-hanging fruit, such as ticket revenue. We look forward to seeing how Amadeus' Offer Optimization model and the inclusion of competitor information can bring our forecasting model to the next level.*



Erik Winter, Team Leader Revenue Management Systems, SAS

## Times of crisis often accelerate innovation and change

The Amadeus Revenue Management R&D and Machine Learning Services team work together to continuously define new data-driven models to identify changes in demand patterns. The goal is to have a future-proof revenue management solution while continuously innovating to optimize airline revenues.



*The pandemic has caused us to reflect on the unique challenge for the future of Revenue Management systems. With diminishing historical flight demand data, we have been assessing our technology based on what our customers are telling us, taking that information and building it into our products. Ultimately, we want to move our customers towards a competitor-aware revenue management system (CARMS) that allows competitor price information to predict how each airline will respond to changes compared to other airline prices. With CARMS and AFA modeling techniques under our belt, we are confident we can overcome obstacles and bring new solutions to life that add value to airlines.*



Benjamin Cany, Director, Airline Offer Optimization, Amadeus

## SCANDINAVIAN AIRLINES

Based in Stockholm, Scandinavian Airline System (SAS) is the national airline of three Scandinavian States; Denmark, Norway, and Sweden operating three primary hubs at Copenhagen-Kastrup Airport, Stockholm-Arlanda Airport, and Oslo Gardermoen Airport. SAS' network consists of extensive regional services within Scandinavia and Europe as well as international services to Asia and North America. SAS is a member of the Star Alliance.

## AMADEUS

Amadeus serves most of the world's leading airlines operating with different business models. Amadeus' solutions allow airlines to grow revenue, optimize efficiency, and build brand loyalty. Amadeus supports airlines so they can provide travelers with a consistent, personalized customer experience throughout every stage of the journey – from inspiration to booking, check-in, and boarding. Navitaire delivers proven digital e-commerce-first solutions enabling advanced retailing using a single record approach. Together, we combine a deep understanding of airline's business with the ability to design and deliver the most complex, trusted, and critical capabilities our customers need to power their retailing transformation and create new cooperation models for airlines.

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