

Optimization soars at American Airlines

success story: optimization



Client	American Airlines, serving nearly 100 million passengers annually
Challenge	Increase revenue and reduce costs in a highly competitive, low-margin industry and difficult economic environment
Solution	FICO™ Xpress Optimization Suite
Results	Optimized processes that lead to increased revenue, reduced costs and improved customer service



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—Armando Silva,
managing director of operations
research, American Airlines

For the average airline passenger, a successful flight means getting from point A to point B safely and on time. But for the people who work behind the scenes at American Airlines and American Eagle, success also depends on a long and complex list of other factors—scheduling flights, juggling connections, working around bad weather and assigning crew for nearly 4,000 flights a day.

Add a lagging economy, and it becomes clear: Running a successful airline is no small feat.

“In today’s economic environment, and particularly in the airline industry where margins are very small, maximizing revenue and reducing cost is a big deal,” says Armando Silva, managing director of operations research at American Airlines. “Throughout our history, but particularly in these tough economic times, this is the challenge we’ve faced: How do we take it an extra step? How can we continue to improve processes and run a more cost-effective, efficient and safe operation?”

Consider that the company strives to provide a positive experience to 100 million passengers each year, and the sheer scale of its challenges becomes mind-boggling. American Airlines continually works to optimize its operations in a way that can minimize cost and maximize revenue, while maintaining the highest levels of safety and providing quality service to its passengers. The company has worked toward

these goals with optimization tools for many years, but the operations research team wanted to push the bar even higher.

Optimization tackles business-critical challenges

The airline industry is intensely competitive. Newer airlines, started in the last decade or two, have considerably lower operational costs than legacy companies such as American Airlines. Fuel prices can spike unpredictably, making profitability on individual flights a challenge. Such razor-thin margins require American Airlines to build efficiency into every part of its operations.

“The difference between selling a couple of seats or not can be the difference between being profitable or losing money on a flight,” Silva says. “In a business with challenges that are as complex and large as ours, you have to rely on optimization.” And that kind of optimization, Silva says, is “something you can’t do by hand or with a simple tool.”

American Airlines turned to the FICO™ Xpress Optimization Suite. Xpress is designed to help organizations solve large-scale challenges, and for American Airlines, this includes making critical resource allocation, asset management and scheduling decisions. The technology includes a set of advanced tools for users to develop their own optimization models.

With the help of FICO, American went through an extensive testing and validation process of Xpress. Results were good and runtimes were fast.

"That's a make-it-or-break-it result," Silva says of Xpress's impressive runtimes. "A program that takes 25 hours to run something is not that useful." Based on these results, American decided to implement Xpress at its headquarters in Fort Worth, Texas.

Solving problems with innovation and speed

Today, Xpress touches many important parts of American's operational decisions, from long-term planning to last-minute rerouting of passengers.

First, American Airlines' operations research team works in conjunction with the business units to develop answers to the business issues they are trying to solve. Next, the operations research and decision support group develops the algorithms, processes and methodologies for how to solve these problems. Xpress helps them do this by narrowing down and choosing the best possible answers—a critical capability when the options are virtually innumerable and comparing them is difficult. They then partner with other groups in IT Services to put into production and run the Xpress-based systems on a daily or weekly basis—whatever frequency is required.

Optimization techniques are widely used at American Airlines. For example, when a customer visits AA.com and purchases a ticket, the revenue management group must

reoptimize to determine pricing and availability for the remaining seats. When a snowstorm hits Chicago, the system operations control, reservations and revenue management groups must reoptimize to determine how, where and when to reroute disrupted customers. When an airplane's maintenance parts are waiting in Dallas, Chicago or any other city American serves, the maintenance and engineering and system operations control groups must reoptimize to get the plane to the same city as its scheduled maintenance. Many of these functions now rely on applications that use Xpress to perform the required optimization.

Silva says Xpress has expanded his team's ability to innovate and apply optimization to improve business decisions and build more productive systems.

"My team is more productive because they have more access to these kinds of tools, Silva says. "They're less constrained by what they can use to solve their problems. It was a hit in my group, that's for sure, when we signed the agreement with FICO."

Better optimization leads to improved customer service

At American Airlines many groups benefit from Xpress-powered applications, such as operations control, scheduling and maintenance and engineering, to name a few. These groups benefit from Xpress and make critical business decisions based on data generated by Xpress applications. These decisions ultimately affect customers, making improved customer service a valuable result of the decision management tool. "For example, when we have a disruption,

we do a better job of getting people to their destination," Silva says. "That is clearly improved customer service."

Optimization spreads throughout the enterprise

When American Airlines selected Xpress Optimization Suite, one deciding factor was the ability to sign an enterprise-wide agreement. That means the OR team can deploy optimization in the face of more challenges throughout the company.

"Cost was limiting the number of optimization applications we were able to use," Silva says. "Now, with an enterprise Xpress license, we're expanding our use of optimization engines into other areas. We're less concerned about monitoring the use of these tools. With the cost savings we have the freedom to use technology where we need it."

Looking forward, Silva says he and his team will continue to scour the enterprise for ways to help the business run more smoothly, better serve its millions of customers and ultimately maximize the company's revenue and profitability.

"The Xpress Optimization Suite agreement with FICO, for us, has been an enabler to do more of these things," Silva says. "Looking forward, we will continue to see where we can use it. We know for a fact there's a lot more to be done out there."



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