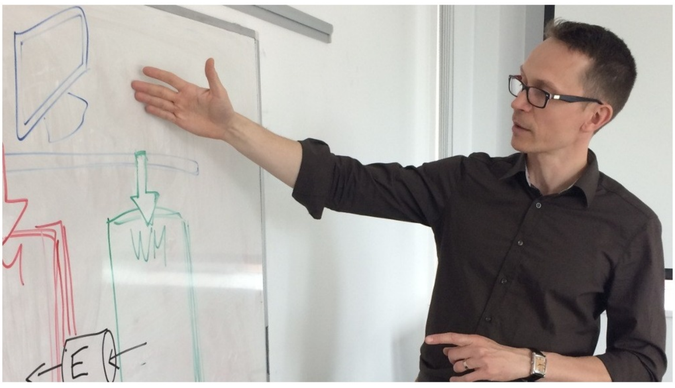
Fascinating research project

Recently we already reported on our way to the optimal price for extra luggage and the EU project PROCESS. Now Balázs Somoskői describes his personal intention and his insights.



By **Anna Magdolna Orosz**
anna.orosz@lhsystems.com

07. August 2020

OneFuture

#LufthansaSystems

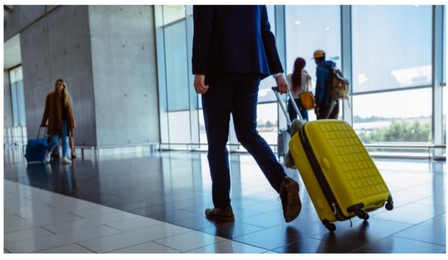
Dynamic pricing is one of the hottest topics in the aviation industry, but so far it has mostly concerned seats. Balázs Somoskői, software architect at LSY in Budapest **recently participated in an EU Horizon 2020 research project** together with colleagues in Berlin to use machine learning algorithmic methods to determine revenue-optimal prices for baggage. In our interview Balázs tells us more about the project.

What was the project about?

The goal of our participation in the EU Horizon 2020 research project called **PROCESS** was to provide an industry use case and to validate the industrial usability and benefits of academic research.

PROCESS provides hard-, and software environments specially developed to enable exascale data processing[1]. For calculating prices dynamically and thus increasing revenue, we need a platform that can handle data – even if today not yet on exa scale, but – on a very high scale. As part of the project, we first determined with the help of machine learning algorithms how likely it is that somebody would purchase checked-in baggage, the so-called first bag. We identified the correlating parameters – the features - and created models based on different algorithms. Then we trained these models and ran simulations to compare the revenue generated by fixed pricing for baggage and by dynamic pricing.

For the airline industry, this can be a first step towards dynamic pricing that can be extended with the AI-fueled dynamic pricing of bookings because currently the prices are still determined mainly by a team of highly skilled pricing analysts. Our longer term overall objective is that in the future airlines shall be able to calculate these prices even in real time – i.e. when flights are booked.



How did you get involved?

In the past I've already participated in similar EU-funded research & development projects on behalf of Lufthansa Systems so when our colleague in Berlin, Stefan Spahr contacted me about this opportunity, I gladly joined the team. The PROCESS project started 3 years ago and will come to end in October, and I got involved about 2 years ago.

What was our part in the project?

The objective of PROCESS is to provide an open source, multi-purpose, scalable architecture to process exascale data. And our pilot project tests and demonstrates that the data service prototypes and the platform developed through the project work in real world settings as well, with an industrial use case. We came up with an architecture that fits on the provided platform. To be able to realize our architecture we continuously formalized our requirements against the new platform. Our measurements and testing results were an important feedback for our research partners. This is our most valuable contribution to the project: the real feedback/experience from the industry.

Why is it innovative?

The fastest supercomputers in Europe today solve problems at the petascale—that is a quadrillion (10^15) operations per second (FLOPS). Of course these petascale systems are really powerful, but the next milestone in computing in the future will be the exascale—a higher level of performance in computing with 10^18 FLOPS. So with this project we're really at the edge of IT capabilities, developing, playing with and testing the most innovative AI and machine learning methods and possibilities.

What did you enjoy the most about this project?

The PROCESS is a very international research project. It was established as a consortium of prestigious European universities and academic research institutes across the continent. I had the privilege to work together with students and researchers based in Germany, the Netherlands, Slovakia, Poland, Switzerland. Partnerships between academia and the industry can be really fruitful, especially when all our interests point in the same direction: to come up with an innovative solution that in our case can make the flying experience better for all parties involved.

1 **Exascale**
Exascale computing refers to computing systems capable of calculating at least 10^{18} floating point operations per second (1 exaFLOPS). The terminology generally refers to the performance of supercomputer systems and although no single machine has reached this goal so far, there are systems being designed to reach this milestone.