



Optimizing Cargo Capacity Decisions Using Data Science

**Air Canada Cargo – Commercial
Division Use Case**

Data Science team, Air Canada Cargo

2025-06-02



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Agenda

- 1 Welcome & Air Canada Cargo Connect
- 2 Business Context & Key Challenges
- 3 What You'll Be Predicting and Building
- 4 What Data Will You Use ?





“Imagine a world where bookings are free... until the plane leaves. No commitment, no guarantee. That’s how air cargo works. So how do we plan with confidence in a world of uncertainty? That’s where you come in.”

Business Context

The Challenge

Cargo bookings are free until flown — creating major uncertainty for the Capacity Management team.

The Risk

Last-minute no-shows, rebooking, or cancellations leave space unused, and revenue lost.

The Need

We must prioritize high-impact flights and reliable customers to minimize disruption.

The Opportunity

Data science can transform flight and customer data into daily decision support tools.

Key statement from Capacity Team

Data Science Team



What I Do Every Day

1. Monitor **flight capacity curves**
2. Flag **critical flights** for intervention
3. Evaluate **customer reliability**
4. Decide when to **overbook or bump**
5. Coordinate with **Sales & Ops**

Daily Challenges

"Bookings are **free** — we earn only if customers show up"
"**No-shows, late cancellations, and last-minute rebookings** disrupt plans"
"I need **fast, clear insights** to avoid losses"

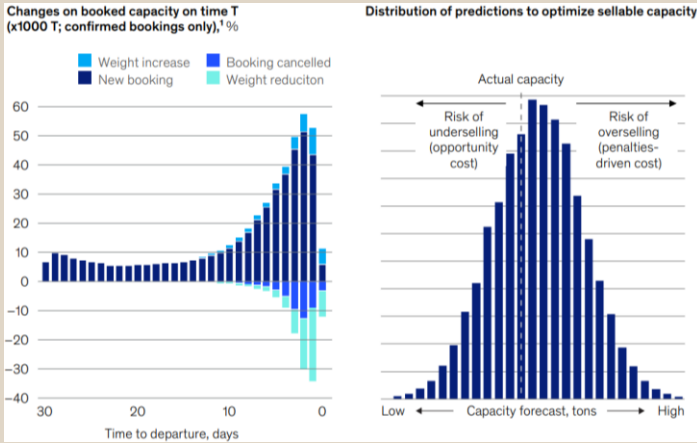
What We Need to Deliver

1. A way to **prioritize flights** based on risk and revenue impact
2. A method to **score customer reliability** (who's likely to show up?)
3. A system to **flag risky bookings** (no-shows, late cancellations, rebooking)

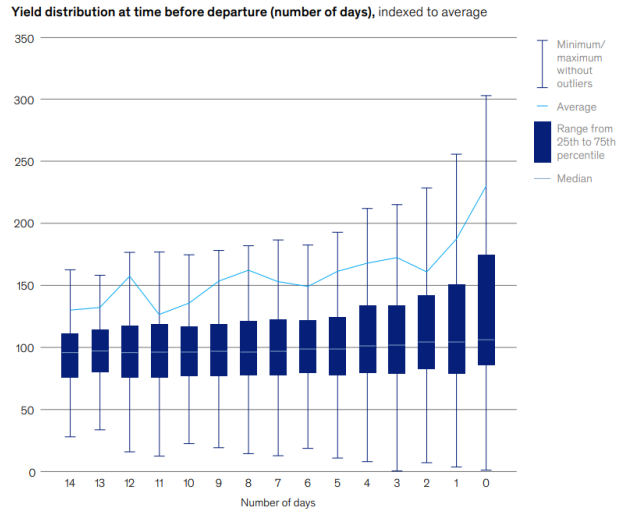
How We Help

Turn complex data into **daily, actionable insight**
Provide **early warnings** to prevent last-minute surprises
Automate **decision support** so they can act fast — not guess

McKinsey Global Institute Report
+
For more Information about Cargo Industry



Yield spread widens as departure date approaches.



What You'll Be Predicting and Building

Your Goal is to help the Capacity Management team **prioritize flights and customers** by combining **profiling** and **prediction** at the Booking-Flight level

What You'll Do :



1

Flight Potential

Classify flights based on frequency, capacity tightness, and yield potential

Which flights are "high-stakes" and can't afford errors?



2

Customer Reliability

Analyze past behavior to determine reliability

Who shows up consistently? Who often cancels or rebooks?



3

Booking-Flight Risk Prediction

For each booking segment (booking + flight), predict:

- No-show probability
- Late cancellation risk
- Last-minute rebooking risk
- Operational bump risk

Which bookings are most likely to disrupt operations?

What Data Will You Use?

What's Already Done?

- ✓ Data Cleaning
- ✓ Event Labeling
- ✓ Dimensional Aggregation

What You Need to Do?

Use this preaped dataset to:

- Profile flights & Customers
- Predict risk of disruption at Booking-Flight level
- Recommend prioritization Strategies based on insights

You'll work with **5 structured tables**, covering over **29 million rows** of historical data. Each one offers a different perspective on flights, bookings, and customer behavior.

<i>Table Name</i>	<i>Description</i>	<i>Volume (in millions)</i>
<i>Flight Curve</i>	Daily evolution of available capacity per flight	1.84 M
<i>Booking Flight Curve</i>	Daily evolution of bookings per flight segment	17.82 M
<i>Flight Performance</i>	Metrics on flown cargo, load factor, Show rates, No show patterns, ect	0.16 M
<i>Booking Flight Performance</i>	Booking-level behavior (show up, flown weight, disruptions)	2.61 M
<i>Customer Station OD Performance</i>	Aggregated customer behavior per origin-destination	6.56 M





Thank you!

Merci!



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