Iberia's Optimization Projects

Gurobi Summit 2025

24/10/2025

Who is Iberia?

Flying since

1927

Part of

IAG INTERNATIONAL AIRLINES GROUP

Destinations

+140

Staff*

+15K

Punctuality

1st 2023 & 2024 at Europe

Fleet

+140

*Iberia + Iberia Express

Who is Iberia?

3 main businesses

- Airline
- Maintenance
- Airport Services

Today: Airline & Maintenance

decide4AI – Who we are

We help our clients identify how they can **optimize their operations** and **create advanced analytical solutions** to support decision-making

30%
Growth YtY

70%
Recurrent customers

+150
Expert Consultants

+90%
Solution in production

Commitment
Quality & Security
ISO27001 | ISO9001

+9 customer NPS

Top 1
ChooseMyCompany 2024

Daniel Herrero, Raúl Vindel and Roberto Campelo

Who are we?

Daniel Herrero

Chief Operations Officer
DECIDE

Raúl Vindel Loeches

Head of MRO Data & AI
IBERIA

Roberto Campelo Valencia

Lead of Network Data & AI
IBERIA

MRO - Repairs Optimization

What is MRO?

Maintenance, Repair & Overhaul

Staff

+2100

Heavy Maintenance Ovehaul

+190

Customers

+120

MRO - Repairs Optimization

Problem to resolve

New Engine

139 visits on 2025

15 visits/month

Black Box

Section 1

Black Box

Section ...

Black Box

Final Section

Final Verification, Plams, Welding, Accesories, etc

Reduce TAT!

Achieve target TAT

MRO - Repairs Optimization

Problem to resolve

Reduce TAT!

Achieve
target TAT

Variables

Priority

Duration

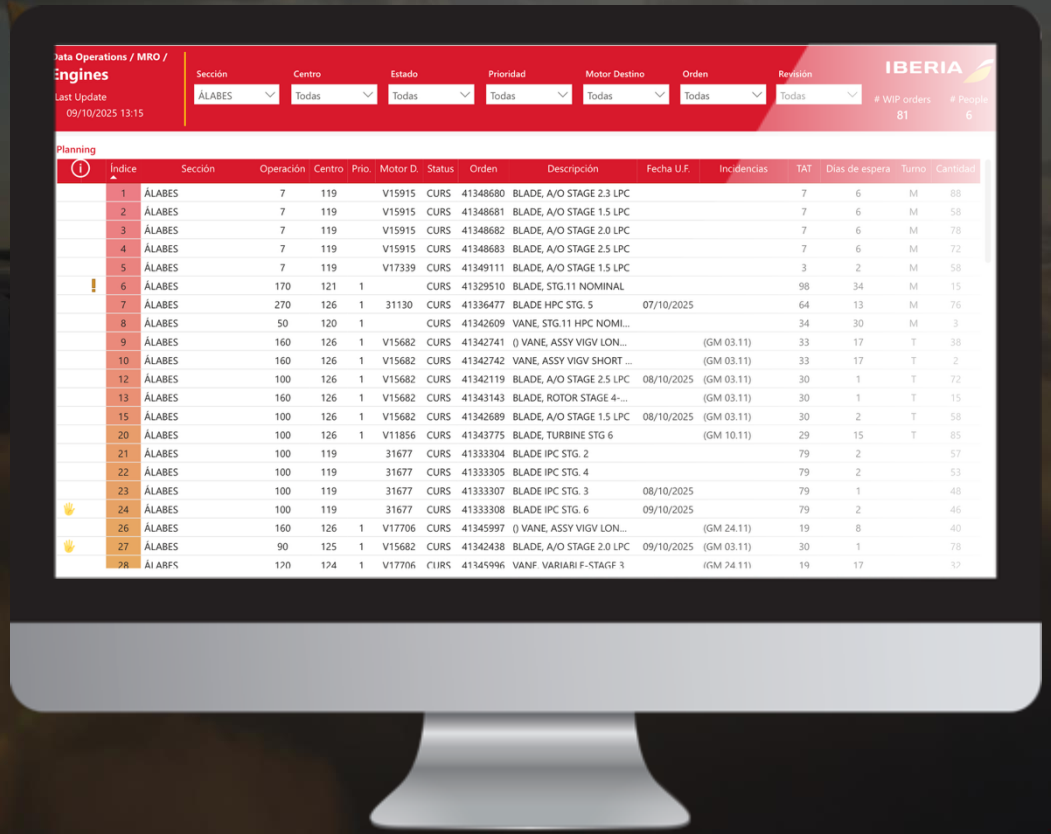
Objective TAT

Last Operation

MRO - Repairs Optimization

Our visual solution

It’s not only an optimization, it’s the value you add around an optimization!!



Índice	Sección	Operación	Centro	Prio.	Motor D.	Status	Orden	Descripción	Fecha U.F.	Incidencias	TAT	Días de espera	Turno	Cantidad
1	ÁLABES	7	119		V15915	CURS	41348680	BLADE, A/O STAGE 2.3 LPC			7	6	M	88
2	ÁLABES	7	119		V15915	CURS	41348681	BLADE, A/O STAGE 1.5 LPC			7	6	M	58
3	ÁLABES	7	119		V15915	CURS	41348682	BLADE, A/O STAGE 2.0 LPC			7	6	M	78
4	ÁLABES	7	119		V15915	CURS	41348683	BLADE, A/O STAGE 2.5 LPC			7	6	M	72
5	ÁLABES	7	119		V17339	CURS	41349111	BLADE, A/O STAGE 1.5 LPC			3	2	M	58
6	ÁLABES	170	121	1		CURS	41329510	BLADE, STG.11 NOMINAL			98	34	M	15
7	ÁLABES	270	126	1	31130	CURS	41336477	BLADE HPC STG. 5	07/10/2025		64	13	M	76
8	ÁLABES	50	120	1		CURS	41342609	VANE, STG.11 HPC NOMI...			34	30	M	3
9	ÁLABES	160	126	1	V15682	CURS	41342741	() VANE, ASSY VIGV LON...		(GM 03.11)	33	17	T	38
10	ÁLABES	160	126	1	V15682	CURS	41342742	VANE, ASSY VIGV SHORT ...		(GM 03.11)	33	17	T	2
12	ÁLABES	100	126	1	V15682	CURS	41342119	BLADE, A/O STAGE 2.5 LPC	08/10/2025	(GM 03.11)	30	1	T	72
13	ÁLABES	160	126	1	V15682	CURS	41343143	BLADE, ROTOR STAGE 4-...		(GM 03.11)	30	1	T	15
15	ÁLABES	100	126	1	V15682	CURS	41342689	BLADE, A/O STAGE 1.5 LPC	08/10/2025	(GM 03.11)	30	2	T	58
20	ÁLABES	100	126	1	V11856	CURS	41343775	BLADE, TURBINE STG 6		(GM 10.11)	29	15	T	85
21	ÁLABES	100	119		31677	CURS	41333304	BLADE IPC STG. 2			79	2		57
22	ÁLABES	100	119		31677	CURS	41333305	BLADE IPC STG. 4			79	2		53
23	ÁLABES	100	119		31677	CURS	41333307	BLADE IPC STG. 3	08/10/2025		79	1		48
24	ÁLABES	100	119		31677	CURS	41333308	BLADE IPC STG. 6	09/10/2025		79	2		46
26	ÁLABES	160	126	1	V17706	CURS	41345997	() VANE, ASSY VIGV LON...		(GM 24.11)	19	8		40
27	ÁLABES	90	125	1	V15682	CURS	41342438	BLADE, A/O STAGE 2.0 LPC	09/10/2025	(GM 03.11)	30	1		78
28	ÁLABES	120	124	1	V17706	CURS	41345996	VANE, VARIABLE-STAGE 3		(GM 24.11)	19	17		32

MRO - Repairs Optimization

Challenges

Understand 100% how it currently works

Constant, endless work without reward

Resistance to change

MRO - Repairs Optimization

Challenges

Understand 100% how it currently works

Iteration and direct contact with users.

There is always something they take for granted and you are missing.

Constant, endless work without reward

MVP - feedback as quickly as possible.

There may be many tasks to perform that add value, but there will be a small number of tasks that really make the difference.

Resistance to change

Communication and understanding from managers to employees.

It is difficult to change the way people work if they do not want to change or if their managers do not allow them. to.

MRO - Repairs Optimization

Final Results

Processed orders per hour

+2000

Execution Time

45

mins

GAP

10%-15%

Difference between best solution and our solution

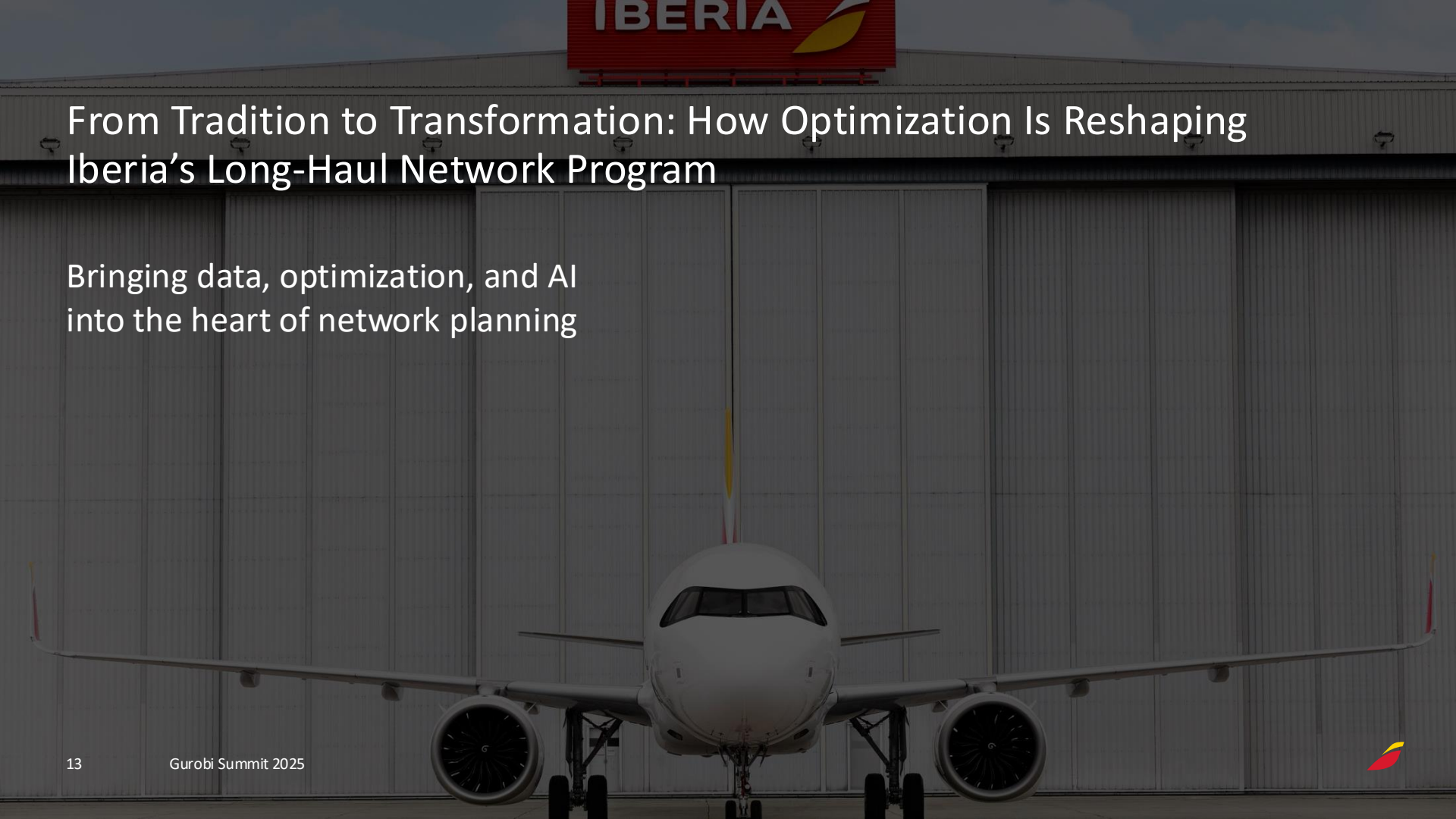
Throughtput improvement

+25%

From ~1500 to ~1875 orders

From Tradition to Transformation: How Optimization Is Reshaping Iberia’s Long-Haul Network Program

Bringing data, optimization, and AI into the heart of network planning



The Long-Haul Operation

Key Concepts

An overview of Iberia's long-haul operation — how rotations are structured and how the flight program is built around Madrid as a single hub.

One hub model in Madrid

All Iberia flights depart from and return to Madrid airport.

Aircraft rotation

Each rotation means one round trip. Madrid -> Miami -> Madrid.

Route & Haul

A route is a specific air connection between two airports operated by an airline. Haul refers to the flight distance or duration used to classify routes as short-, medium- or long-haul.

Iberia's fleet

A320 XLR, A330, A350 for LH flights.

Measuring Profitability

MG1 and Key Metrics

How route profitability is assessed through MG1 — a clear view of revenues, direct costs, and the contribution of each rotation to network performance.

C1
(Costs 1)

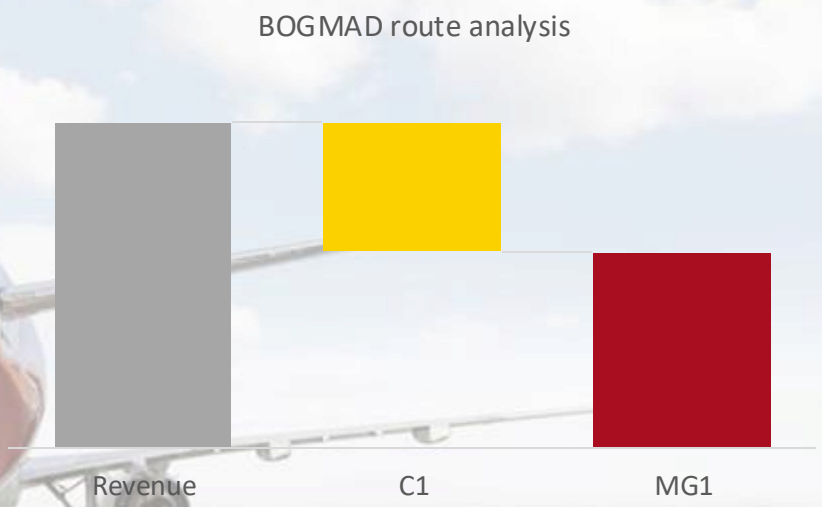
C1 costs means de direct costs associated to the operation of the flight such as fuel, crew, airport, navigation etc.

Revenue

Revenue we get from the operation of the flight from the tickets sold, ancilliaries or onboard sales.

MG1
(Margin 1)

MG1 is obtained by subtracting the C1 costs form the total revenue obtained by the rotation.



The Long-Haul Fleet

Aircraft Types and Strategic Roles

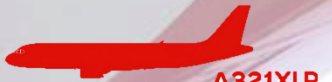
The mix of aircraft that powers Iberia's long-haul network — each type serving a different market profile and strategic purpose.

A350 family

- High capacity (340 pax) and efficiency.
- Newest aircraft with latest upgrades.
- Perfect fit for star routes.
- 3 different cabin configurations one without premium ECO.

A330 family

- Very versatile with medium capacity (285 pax).
- Ideal for mid-demand routes.
- 2 different cabin configurations one without premium ECO.



A321 XLR family

- Narrow body for thinner long-haul routes.
- High eficiency.
- Ideal for adjusted MG1 routes.
- Very flexible

3 different type of cabins

- Business cabin
- Premium ECO cabin
- Tourist cabin

The Traditional Planning Approach

How the Long-Haul Schedule was built

How the long-haul flight program was traditionally designed — a manual, Excel-based process built on historical references, fixed rules, and limited scenario analysis. DN (Day and Night) model limitations.

Start: from previous program

Use the existing flight program as the baseline for the new season.

Fleet Availability

Calculate the number of aircraft available for long-haul operations.

Fixed Rules

Manual rules and calculations.

Iterate & Review

Manual Review and adjustments.

The Optimization Approach

From Inputs to Optimized Flight Program

From operational and economic data to optimized decisions — Gurobi transforms inputs and business rules into a high-MG1 flight program. A data-driven optimization powering Iberia's long-haul scheduling decisions.

Simulation Inputs

Operational and economic parameters that define the network boundaries.

- Routes to operate
- Frequency limits per route
- Fleet availability
- Fleet–route compatibility
- MG1 elasticity model

Gurobi Optimization Core

Applies constraints, preferences and objectives to maximize MG1.

- Hard rules: feasibility, fleet, slots
- Soft rules: business preferences, route balance
- Objective: maximize total MG1
- Model: MDTN vs DN capacity

Optimized Flight Program

Final allocation of fleet and frequencies with MG1 results.

- Dashboard in Power BI with all the relevant KPIs
- Fleet per route
- Frequency assignment
- Calculated MG1 per rotation
- Network MG1 summary

Challenging the Status Quo

Transforming the way we make Network decisions

From operational and economic data to optimized decisions — Gurobi transforms inputs and business rules into a high-MG1 flight program. A data-driven optimization powering Iberia's long-haul scheduling decisions.

From **Manual** planning to **Optimization**

Manual, Old Way Planning

- Based on historical programs and expert judgment.
- Excel-driven process with fixed business rules.
- Time-consuming manual iterations.
- Limited ability to test alternative scenarios.

Optimization-driven Planning

- Full integration of operational and economic data.
- Gurobi optimizes fleet and frequencies under all constraints.
- Scenario testing and sensitivity analysis in minutes.
- Objective, data-driven results visualized in Power BI.

Results and Insights

Key Outcomes and Business Impact

Key business outcomes from the optimization model — tangible MG1 improvement, better fleet alignment, and actionable network insights.

MG1 improvement

Profitability optimization across the long-haul network.

+4% improvement in overall MG1

Model GAP below 0,1%

+1 additional LH frequency during summer

Fleet Efficiency

Better fleet utilization through optimized assignment

+30 flights across the network

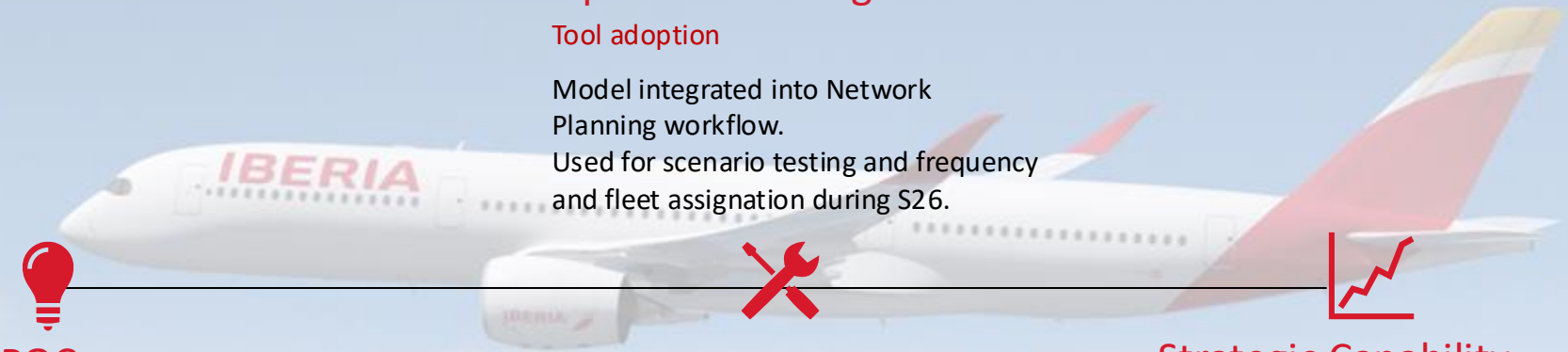
Reduced fleet changes

+7 additional rotations with the same resources

Creating Long-Lasting Impact

From Project to Strategic Capability

Turning optimization into a long-term capability — a scalable tool supporting strategic planning and future scenario analysis.



POC

Proof Of Concept

Development of the first optimization model to improve MG1 margin in long-haul rotations.Validation of the approach and solver performance (Gurobi).

Operational Integration

Tool adoption

Model integrated into Network Planning workflow.
Used for scenario testing and frequency and fleet assignation during S26.

Strategic Capability

Long-term Impact

Optimization Will be a core component of Iberia's planning process.
Foundation for future applications accros the network.

Takeaways

From Tradition to Transformation

From traditional planning to transformation — data, optimization, and AI are reshaping Iberia's long-haul network for the future.

Challenging the Status Quo

- We moved from manual, rule-based planning to a data-driven optimization process.
- Optimization changed how we design and evaluate our flight program.

Creating Long-Lasting Impact

- We moved from manual, rule-based planning to a data-driven optimization process.
- Optimization changed how we design and evaluate our flight program.

Empowering Bold Decisions

- We moved from manual, rule-based planning to a data-driven optimization process.
- Optimization changed how we design and evaluate our flight program.

Thank you.

24/10/2025