Leveraging Data Analytics for Digital Strategy in Commercial Aviation

Airbus

Jayant SEN GUPTA
Central Research and Technology – Data Science
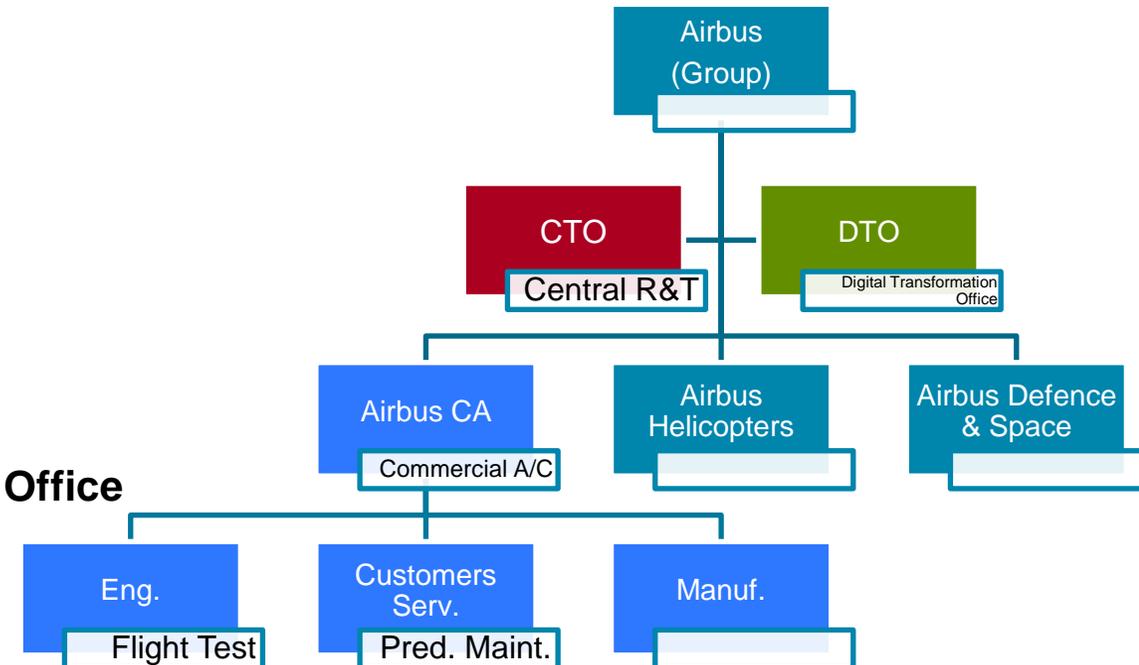October 5th 2017

AIRBUS

Who? Where? Why?

WHO AM I?

- **PhD in Computational Mechanics**
- **Applied Mathematics Department of Airbus Research Center**
  - ➤ *Uncertainty Modelling & Propagation, PHM*
- **Operational Intelligence Department**
  - ➤ *PHM and Data Science*

WHERE DO I WORK?

- **Airbus since 2005**
- **Central Research & Technology, part of Corporate Technical Office**
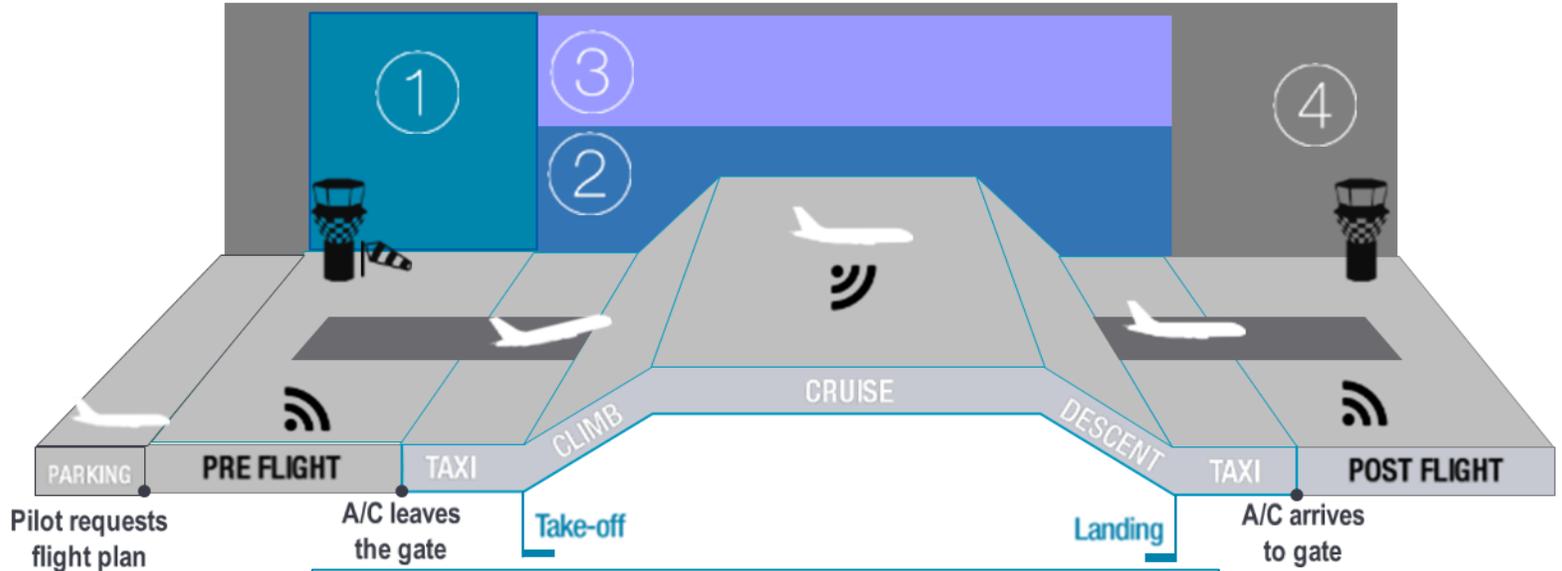- **Located in Toulouse, France**

WHY AM I HERE?

- **PHM for 8 years**
- **Developed predictive solutions with Airbus Customer Services (AiRTHM)**
- **Moved towards Data Science 4 years ago**
- **Involved in many (Big) Data Analytics initiatives**

Airbus
(Group)

CTO
Central R&T

DTO
Digital Transformation Office

Airbus CA
Commercial A/C

Airbus Helicopters

Airbus Defence & Space

Eng.
Flight Test

Customers Serv.
Pred. Maint.

Manuf.

AIRBUS

What?

Experience at Airbus

Pre-Departure Check ①
Monitoring of selected sensible systems before the aircraft leaves the gate
NEW

Flight Watch ②
Continuous monitoring of critical messages to identify root cause during the flight

Predictive maintenance ③
Long term and proactive follow-up of selected critical systems to anticipate potential failures

Preventive maintenance ④
Prevent unscheduled events by monitoring and filtering of all preventive maintenance messages

① ③ ② ④

CLIMB CRUISE DESCENT

PARKING | PRE FLIGHT | TAXI | TAXI | POST FLIGHT

Pilot requests flight plan

A/C leaves the gate

Take-off

Landing

A/C arrives to gate

AiRTHM : Airbus Real Time Health Monitoring

Multiple events (recurring problem)
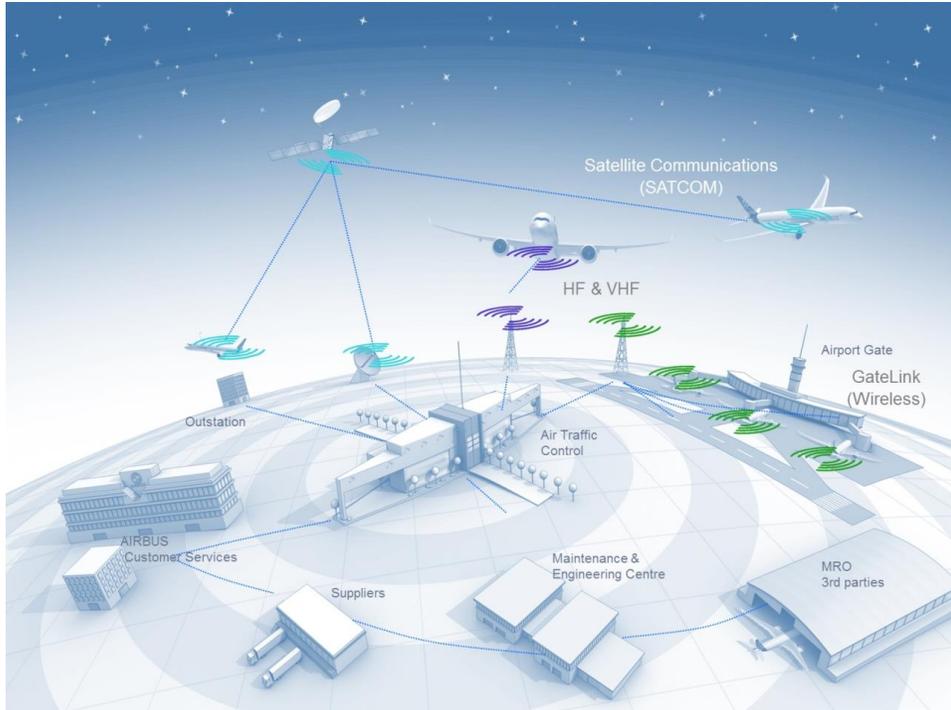
Single event (severe impact)

Zero event (anticipate all OI)
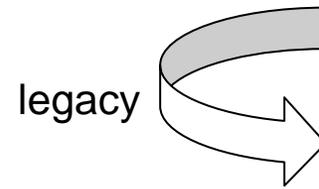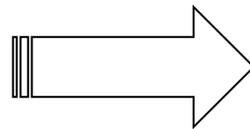
OI: Operational Interruptions

AIRBUS

Get more data

Currently…

- ACARS
- Full Flight Data at station (A350, A380)
- Wireless
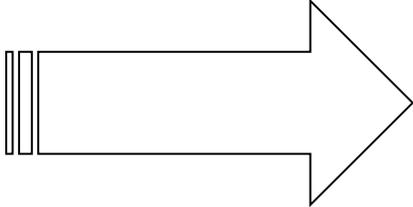- Airline data (Ops, Tech logs, …)
- Supplier data (Shop Findings…)

legacy

FOMAX

Airbus Data Lake

skywise.

With Skywise, unleash
the full potential of every aircraft

AIRBUS

Building Health Indicators / Damage Index

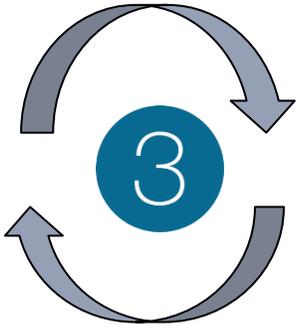**Experts workload**

AUTOMATION

1 Expertise-based

Multi-Functional Teams

- **Health Engineer**
- **Data Analyst**
- **System Specialist**
- **IT Engineer**
- **Suppliers (starting)**

3 Multi Functional Teams
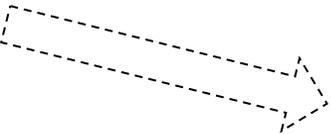
4 Automated Analysis
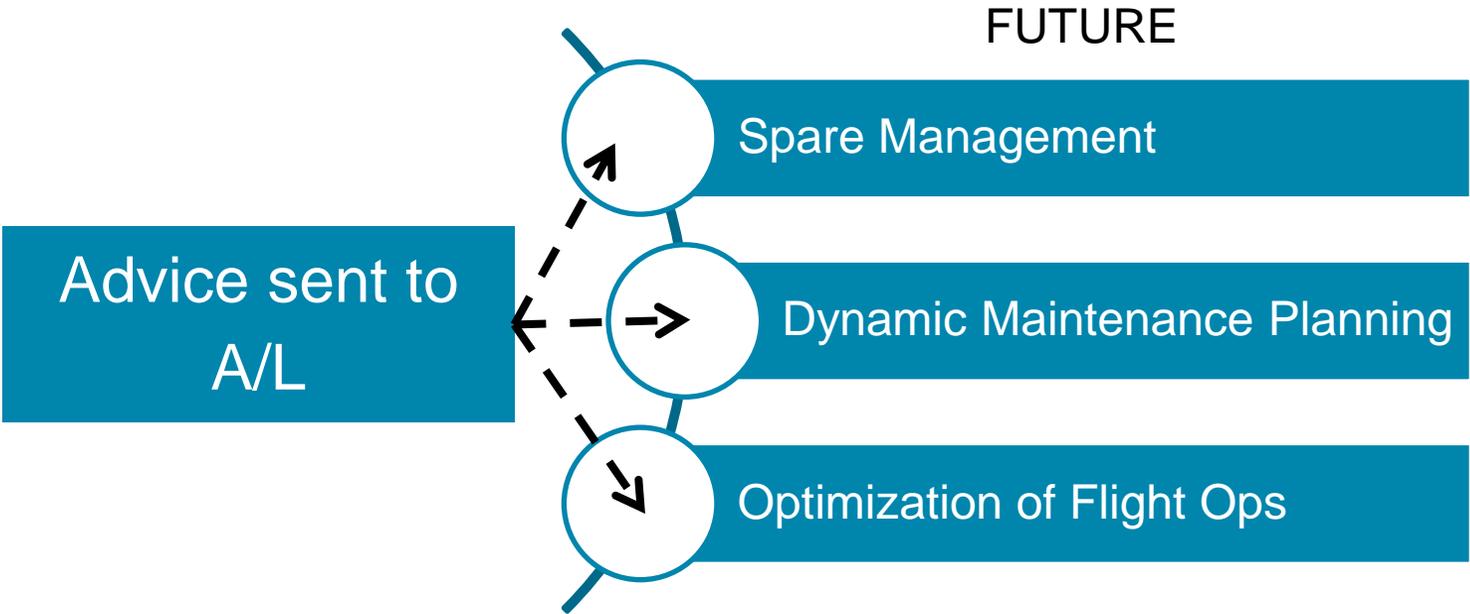
2 BIG DATA

Algorithms complexity

AIRBUS

Integration with Operator / MRO

Maintenance Control Center (MCC)

Line Maintenance / Hangar Maintenance (MRO)

FUTURE

Advice sent to A/L

- Spare Management
- Dynamic Maintenance Planning
- Optimization of Flight Ops

Alliance with MRO

Intimacy with Airlines

AIRBUS

New ways of working with Skywise

$$Trust = \frac{Credibility * Reliability * Intimacy}{Self\ Orientation}$$

Take advantage of skills and knowledge of all stakeholders

Business model Shared value

Better Integration with Operations

Multi Functional Teams with Suppliers

AIRBUS

Thank you

AIRBUS