CHarlie

FlyAI Forum

EUROCONTROL

April 2023

skyguide

skysoft ATM

INGENAV

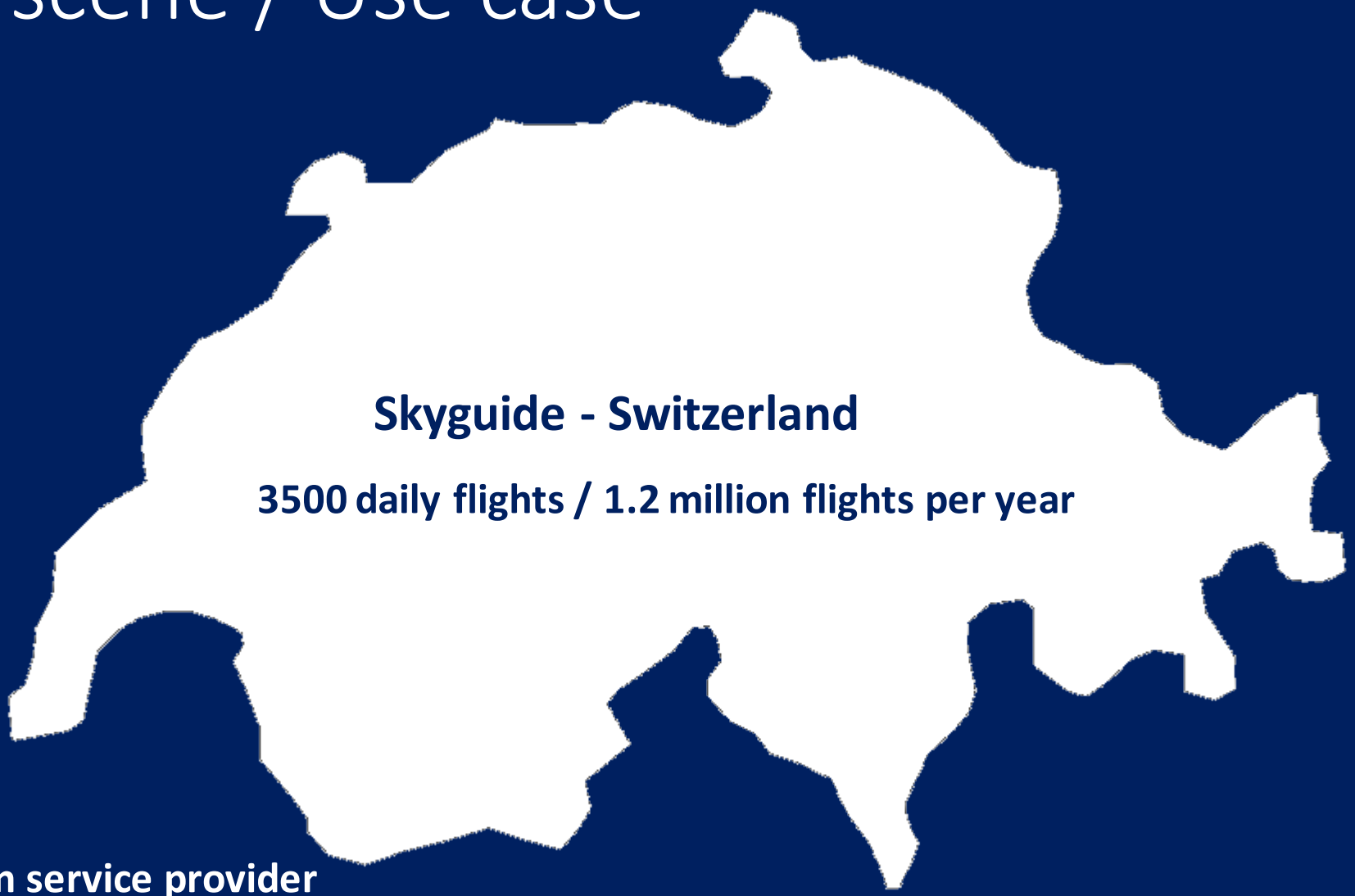
betterizon

What problem are we trying to solve?

- Increasing traffic demand
- Reaching the growth limits with our current support tools
- The need for a future oriented & sustainable solutions
- Reduce the cognitive load on the air traffic controller
- A further step towards network efficiency

In tactical ATC

Setting the scene / Use case



Innovative air navigation service provider

Availability of historical data

Make better use of data

Our approach

Build on current and proven deterministic tools that each ATM system has, that are trusted by ATCOs

Lean and agile multidisciplinary team

Enhance & augment these tools using data & machine learning

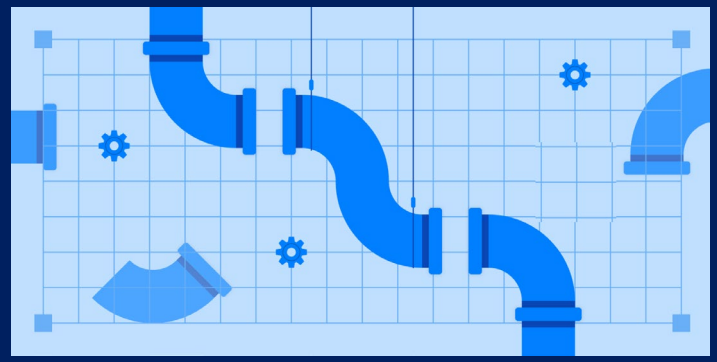
Step-wise approach

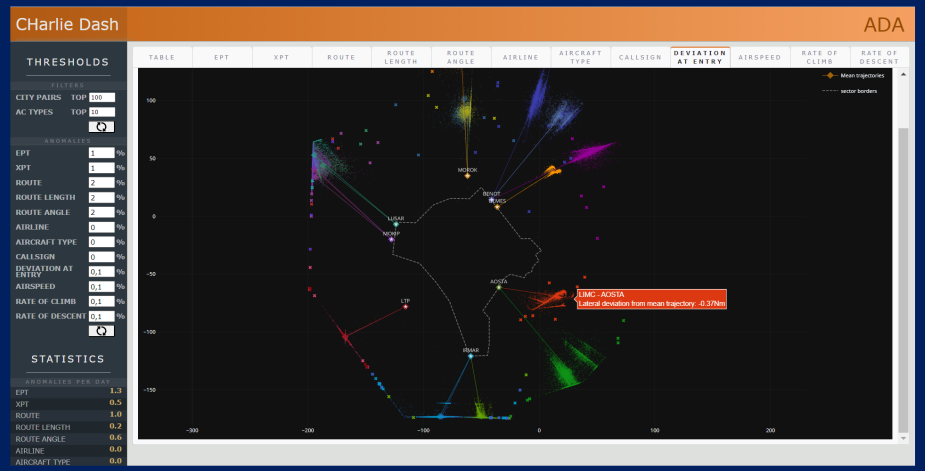
”Plug and play” on any ATM system

Keep the air traffic controller at the center of the decision-making process

The technology

- Data pipeline
- Our non-black box philosophy
- Scoring mechanism
- Iterative deployment and dashboards





4 application areas

- CORA – Conflict Resolution Advisory
- FEED – Flow Efficiency & Early Dispersion
- R4 (ready for) – The nudger
- ADA – Anomaly Detection and Advisory

CORA

- Proposes solutions to detected conflicts
- Uses big data, machine learning and a scoring module to privilege solutions based on pre set business objectives
- Augments conflict detection tools
- Reduction of ATCO cognitive workload
- Integrates with resident ATM system´s conflict detection functions

- Foreseen implementation date - 2027

FEED

- Highlights early identification of future hotspots and proposes efficient resolutions
- Produces suggestions aligned with business objectives (e.g. safe, green trajectories, FRA, etc.)
- Uses big data, machine learning and a scoring module to privilege solutions based on pre set business objectives
- Augments planner / multi sector planner functionalities
- Reduces ATCO´s cognitive workload
- Integrates with resident ATM system

- Currently available as MVP

R4 – Ready for

- Provides safe and efficient support in nominal conditions (climbs / descents / transfers)
- Uses big data, machine learning and a scoring module to privilege solutions based on pre set business objectives
- Augments trajectory prediction algorithms and downlinked intelligence
- Reduces ATCO´s cognitive workload
- Integrates with resident ATM system

- Currently available as MVP – will be used to enhance future trajectory prediction function.

ADA – Anomaly detector

- Supports ATCOs in the detection of anomalies related to flows and individual trajectories
- Uses big data and statistical analysis
- Augments other anomaly detection functionalities (e.g. route or level adherence monitoring)
- Reduces cognitive workload by providing early warnings for anomalies (earlier than human)
- Integrates with resident ATM system to provide warning to ATCOs

- Currently available as MVP – will be used offline as an visual analytics tool.

Impact on operations

- Reduced cognitive load in the decision-making process provides the air traffic controller with more time = more capacity to manage additional flights and/or other tasks
- Enhanced safety
- Optimized flight profiles = reduced carbon footprint = greener
- ”Plug and play” on any ATM system

- We would love to collaborate with other ANSPs in order to elaborate case studies that will serve as a more in-depth demonstration of the capabilities of CHarlie.