Air Traffic Delay Management

Air Traffic Network Manager

1 SITUATION

Air traffic management is essential for ensuring safe and efficient air travel, but increasing demand, unpredictable weather events, and operational disruptions create significant challenges. Limited airspace capacity leads to congestion, delays, and inefficiencies, driving up fuel consumption and emissions. Existing data and systems are often siloed, restricting the ability to predict network-wide impacts and reducing the effectiveness of real-time decision-making. To maintain efficiency and reliability, the industry requires advanced digital solutions that enhance situational awareness and support proactive management strategies.

2 OPPORTUNITY

The client recognised the need for a data-driven approach to optimise air traffic operations and minimise disruptions. Deloitte was engaged to develop a digital solution that could integrate real-time and historical data, forecast potential disruptions, and support proactive decision-making. By leveraging advanced analytics and digital modelling, the client aimed to enhance operational efficiency, improve network resilience, and reduce unnecessary delays across the system. Deloitte's expertise in digital transformation and airspace management positioned them as a strategic partner to drive these improvements.

3 SOLUTION

Deloitte designed and implemented a digital twin of the air traffic network, providing a real-time, data-driven model to enhance decision-making. This tool enables the client to accurately forecast potential disruptions, test future scenarios, and implement optimal mitigation strategies backed by data. By simulating different operational conditions, the digital twin helps the client develop more resilient air traffic plans, reduce network constraints, and improve overall service delivery. The system also allows for greater visibility into airspace capacity, ensuring that resources are allocated efficiently and disruptions are minimised.

Impact

- **25% reduction in planned schedules** without increasing airborne holding, improving operational efficiency while maintaining service reliability.
- **No ad-hoc constraints (departure delays)** at a key airport in May 2024, demonstrating enhanced predictability and planning accuracy.
- **33% efficiency gain in air traffic controllers** in test sectors, enabling staff redeployment to higher-value portfolio or transformation work.
- **Optimised resource allocation**, allowing the organisation to achieve greater efficiency with the same headcount and reinvest savings into strategic initiatives.
- Insights from the digital twin are now being integrated into a **strategic workforce planning system**, ensuring long-term resource optimisation and improved air traffic management.

