

Orchestrating Airside Autonomy

Design an adaptive orchestration model and maturity-aligned transition plan to facilitate the implementation of autonomous airside operations at Schiphol Airport's docking operations across multiple levels of autonomy.

Context

Schiphol Airport has a strategic vision to achieve full **autonomous airside operations by 2050**, driven by the need to address ongoing labour shortages and sustainability goals. This transition requires the development of **intelligent orchestration systems** that can coordinate ground processes with minimal human intervention. This project focuses on the automation of docking operations, where aircraft are guided, parked, and prepared for turnaround, which is currently a manual phase of the airside workflow.

Approach

A foresight-based roadmap design was applied to guide Schiphol's transition toward airside autonomy. The roadmap is structured around **phased progression**, ensuring that technological upgrades, organisational change, and ecosystem coordination evolve in sync. By **aligning system maturity** across these domains, the approach supports controlled scaling and ensures each step is grounded in operational readiness.

The Path to Orchestrating Autonomous Airside Operations

Horizon 1 – Foundation

Building Trust and Data Foundations

- Smart monitoring
- Early automation and remote activation
- Smart forecasting
- Dashboard has a foundational role

Horizon 2 – Collaboration

Facilitating Collaboration and AI-Integration

- Smart coordination
- Predictive analytics
- Smart alerts
- Dashboard has a suggestive role

Horizon 3 – Autonomy

Achieving Operational Autonomy and Resilience

- Automated sequencing
- System resilience
- Automated fallbacks
- Dashboard has an active role

Final Strategic Objectives

Autonomous Orchestration with Human-Governed Oversight



Deploy AI-driven systems to manage airside operations while preserving ethical and strategic human supervision.

Human-Centric Transition & Workforce Evolution



Support workforce adaptation by reducing reliance on physical labor and upskilling personnel.

Transparent, Auditable, and Trusted AI Systems

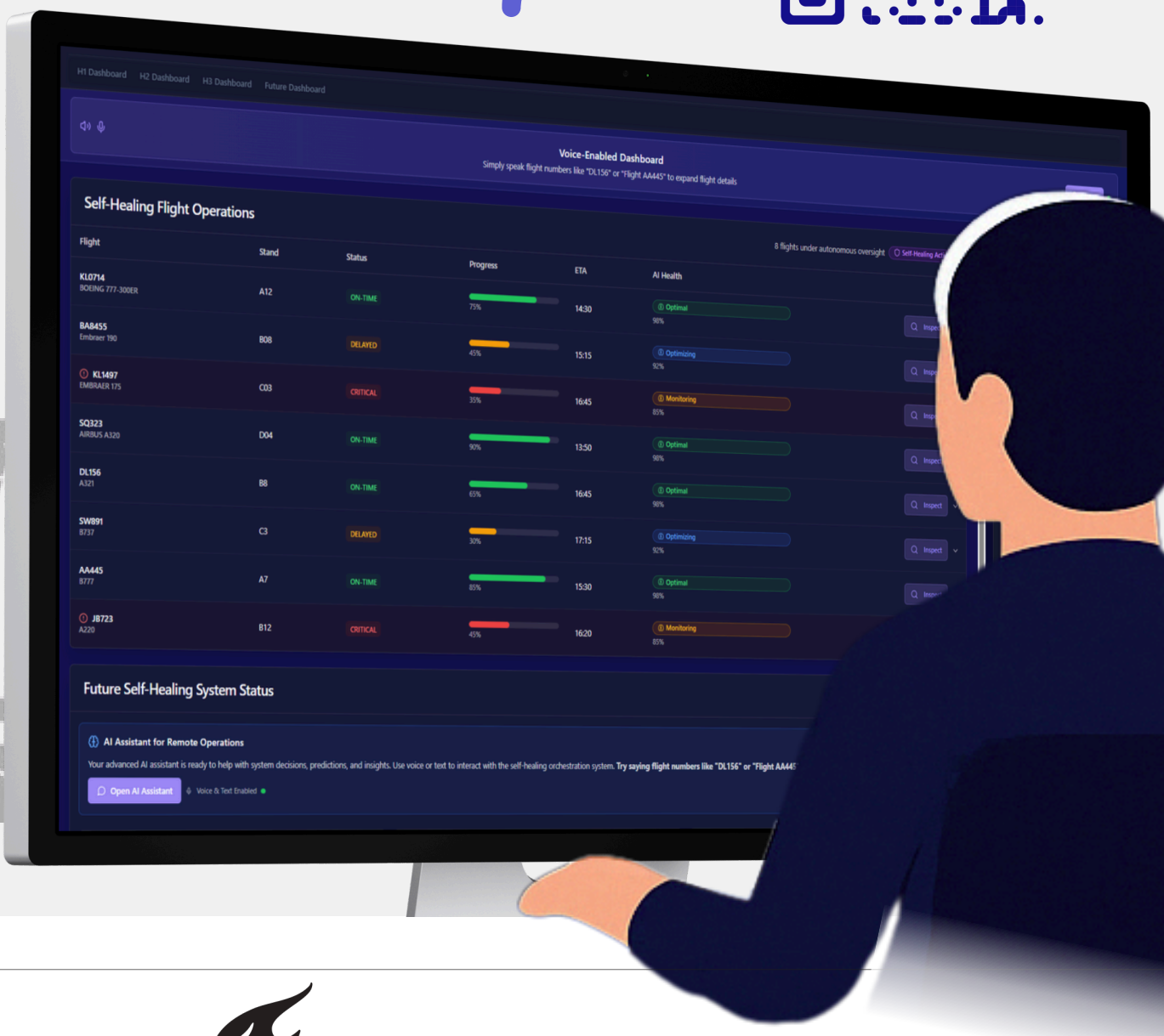
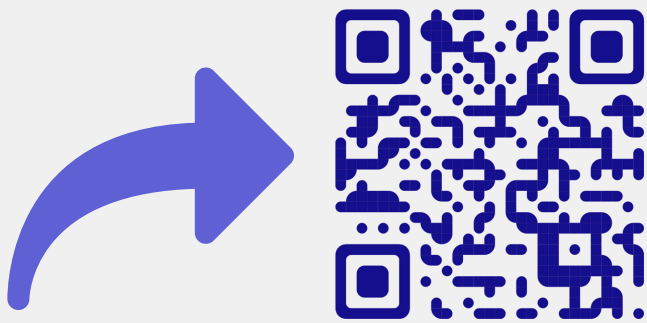


Ensure full traceability of autonomous decisions through explainable logic, system logs, and oversight dashboards.

Resilient and Scalable Operational Automation



Enable autonomous systems to detect and resolve anomalies, adapt to complexity, and operate at scale without manual recovery.



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