

Digital Twin–Driven Industrial Excellence & Resilience for Aerospace Manufacturing

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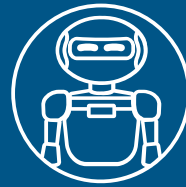
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Digital Twin–Driven Industrial Excellence & Resilience for Aerospace Manufacturing



Flow Simulation to
support a complex supply
chain in a booming
industry



**Artificial Intelligence
ecosystem** to enable
resilient Industrial System



**Industrial System
Engineering** Human
intelligence to drive
decisions

Flow Simulation to support a complex supply chain in a booming industry

- **Complex Supply Chain**
20 majors assembly sites
3000+ active tier-1 suppliers in 100+ countries
3 to 4 millions components in an A350
- **Booming Industry**
Ramp-up in all Airbus Aircraft programmes
+10% increase in deliveries 2025/2026 targeted
Airbus backlog of 9200 Aircrafts
- **Robust Industrial System Design**
Product safety as a key priority
Anticipation and de-risking
Continuous transformation



**Anylogic is enabling cloud based,
versatile and multi method modeling
solution**

Artificial Intelligence ecosystem to enable resilient Industrial System

- **From discrete event to multi-method simulations**

Predict/Optimize/De Risk in a VUCA world
Agent based simulations to enrich models
Performance in execution

- **Robust visualisation with Omniverse**

Open ecosystem (USD libraries)
Enhanced end-user experience
Improved simulations (clash detection, light...)

- **Physics AI to enrich models**

Physics-based accuracy of model (gravity, friction...)
Integration in Omniverse to analyse collisions, motions...



Connection to this ecosystem is a must to increase accuracy of models and pave the way to industrial Digital Twin

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Industrial System Engineering Human intelligence to drive decisions

- **Data is the gold mine**
Data acquisition and data management
Sovereign infrastructures to train models
- **Dual profile as a condition of success**
Industrial System Engineering job
Connecting virtual and physical world
Use case ownership for each studies
- **Human connection to shop floor**
Gemba attitude
Lean Manufacturing foundations
Active community



The Human asset is as important as the Digital asset

Future Horizons PoCs & Tech Roadmap

POC DONE • SCALING



1. RL & Simulation in Operations

Successfully proved Reinforcement Learning policies coupled with AnyLogic for autonomous decision-making.

Next Step: Expanding directly into business operations and live shop floor dispatching to automate dynamic AGV re-routing and buffer balancing.

Target: Production Rollout

UPCOMING POC



2. Omniverse 2-Way Integrator

Developing a bi-directional connector between AnyLogic logic and NVIDIA Omniverse via OpenUSD.

Next Step: Near-future PoC enabling real-time physics feedback (gravity, inertia, kinematic collisions) directly influencing discrete flow state transitions.

High-Fidelity Physics Twin

NEXT-GEN R&D



3. LLMs & Next AnyLogic

Looking forward to integrating Large Language Models with the upcoming version of AnyLogic.

Next Step: Enabling natural language simulation queries ("Run sensitivity on 48h crane outage") and auto-generating simulation scenario configurations.

Conversational Simulation

POC STARTING NOW

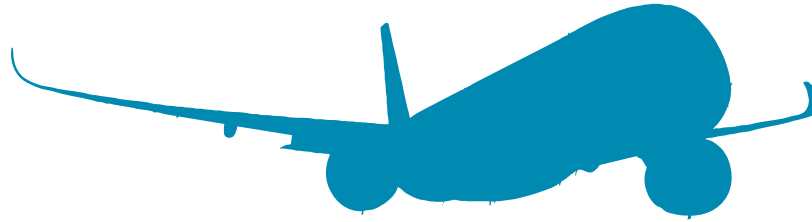


4. Live Twin: OPC UA & MQTT

Initiating a proof-of-concept integrating native OPC UA client and MQTT broker connectors.

Next Step: Streaming continuous shopfloor telemetry and machine state changes directly into running digital twin models for true closed-loop synch.

Real-Time Shopfloor Feed



Connecting data, Advanced Simulations
fueled by AI, and Human Expertise is
transforming **operational complexity** into
sustainable Industrial Excellence!



Anjali Thakur



Lead Industrial Engineer,
AIRBUS



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Thank you

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