

# Transforming Aviation with AI-First Engineering

By leveraging Gen AI-driven solutions, we help our customers tackle operational inefficiencies, enhance workforce training, and eliminate data silos, leading to improved productivity and safety across the aviation sector.



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## Industry Wide Challenges



### Operational Inefficiencies

Inefficiencies such as equipment downtime, inconsistent processes, rework, and inadequate worker training significantly inflate production costs and disrupt crucial workflows.



### Workforce & Skill Development

As the aerospace industry evolves, retiring experts leave a skills gap. This makes it essential to empower maintenance workers with advanced tools and training.



### Poor Decisions Due to Data Silos

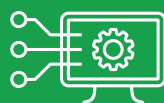
Unstructured, fragmented data hampers real-time insights, slowing decision-making and affecting productivity and strategy planning.

## Solution Offerings by Quantiphi



### Sourcing & Procurement

- ◆ Supplier Risk Assessment
- ◆ Contract Management
- ◆ Inventory Management



### Production Grade Solutions

- ◆ Hybrid (IoT + LLMs) Predictive Maintenance
- ◆ Visual Quality Inspection
- ◆ Digital Twins for Design, Planning & Optimization
- ◆ AI-Powered Training Recommendation System



### Advanced Insight & Analytics

- ◆ Fleet Optimization and Route Analytics
- ◆ Workforce Analytics and Optimization
- ◆ Compliance Monitoring

## Success Stories

### RAG-Powered Semantic Search For Aerospace Repair Manuals

#### ◆ Problem statement

An American manufacturer wanted to develop an end-to-end conversational semantic search pipeline for rapid retrieval of information from large volumes of repair manuals to improve the efficiency of maintenance personnel.

#### ◆ Quantiphi Solution

Developed an end-to-end conversational AI chatbot to retrieve information from a large volume of repair manuals powered by NVIDIA NeMo & Triton.

Questions posed by the user will be encoded and passed to the retriever model. With the encoded input question retrieval model shortlists the passages from the document store.

The generator model tries to generate the correct response based on retrieved information. Answer Re-Ranking reorders the answer candidates generated and finds the best answer.

#### ◆ Business Impact

- **Rapid Response Time:** Achieved real time response, ensuring swift and efficient access to information.
- **High Retrieval Accuracy:** Attained 80% accuracy, significantly improving operational efficiency and maintainer productivity.

### Adaptive Learning System for Training Courses

#### ◆ Problem statement

An American manufacturer wanted to create a recommendation engine to recommend available training options to maintenance workers based on their historical performance and tasks allocated.

#### ◆ Quantiphi Solution

Quantiphi developed a functional AI/ML-powered application to recommend courses to maintainers to enhance maintenance effectiveness using task & training assignment, completion patterns.

Automated evaluation with reporting & progress tracking for each worker across tasks, in comparison to other maintainers.

Continuous analysis of training & courses using AI/ML, to identify improved learning courses users can take.

#### ◆ Key Advantages

- **Faster Onboarding and Training:** New workers or workers transitioning to new roles can be trained more quickly as the module adapts to their learning pace, reducing the time required for them to be productive.
- **Reduced Errors and Downtime:** As workers are continuously trained and tested on real-world scenarios, they can reduce the occurrence of mistakes, leading to fewer maintenance errors and minimizing aircraft downtime.

**Lead the way in Aerospace and Defense with Next-Gen AI innovation.**  
**Connect with us to fast-track your AI journey.**

