



POINT OF VIEW

# An AI-Led Path to Modernizing Business Platforms for Airlines

Reimagining Airline Operations for a Customer-Centric, Real-Time Future



# Navigating the Digital Storm: From Legacy Platforms to Intelligent Airline Enterprises

The global airline industry is standing at an inflection point. What began as a gradual digitization of customer interfaces has accelerated into a full-scale reinvention of airline business platforms. Airlines today are not only competing on routes and fares; they are competing on experience, resilience, speed, and intelligence.

Passengers now expect airlines to operate like digital natives, anticipating disruptions, personalizing offers in real-time, and responding instantly across all channels. Yet behind many sleek mobile apps and modern Passenger Service Systems (PSS) lies a fragile operational core built decades ago. These legacy platforms were designed for stability, not agility, for efficiency, not intelligence.

Modernization, therefore, is no longer an IT refresh. It is a strategic imperative that touches every part of the airline, from network planning and flight operations to crew management, disruption handling, and revenue optimization. Airline Modernization Systems are a critical part of this journey, but they are only one piece of a much broader business platform transformation.

This shift is no longer aspirational; leading airlines are already committing significant capital and leadership attention to modernizing their core business platforms.

## Industry Context: Airlines Are Betting Big on Platform Modernization

Leading carriers are already committing significant investments to future-proof their technology foundations:

- Southwest Airlines earmarked USD 1.7 billion for technology and cloud initiatives in 2024, positioning digital platforms as growth enablers. (Source: CIO Dive)
- British Airways is migrating nearly 700 systems to the cloud as part of a GBP 750 million transformation to embed AI and automation across operations.
- Delta Air Lines completed a large-scale cloud migration, supporting record revenues of USD 61.6 billion through data-driven operations. (Source: Mordor Intelligence)

While much of the early focus was on customer-facing platforms, the next frontier is the operational backbone, where delays are prevented, crews are optimized, aircraft are utilized efficiently, and disruptions are absorbed with minimal customer impact.

As these investments mature, airlines are realizing that sustainable returns depend not just on modern customer interfaces, but on strengthening the operational platforms that execute every flight, every day.

## Beyond PSS: How Operational Platforms Enable Airline Business Performance

Passenger experience is shaped long before a traveler opens a mobile app. On-time performance, disruption recovery, crew availability, aircraft readiness, and regulatory compliance are outcomes of how effectively airline operations execute in real time.

A modern airline business platform must therefore orchestrate decision-making and data flow across:

- Network and schedule planning
- Airline Modernization Program
- Maintenance and engineering (MRO)
- Airport and ground operations
- Revenue, finance, and analytics

Among these, the Airline Modernization Program is at the center, continuously coordinating aircraft, crew, flight plans, safety checks, and real-time operational control, enabling airlines to operate reliably, recover faster, and translate operational decisions into consistent business outcomes.

However, many of these operational platforms are still anchored to legacy cores that were never designed for real-time orchestration, intelligence, or continuous change.

## The Looming Crisis: The Mainframe Trap in Airline Operations

At the heart of the challenge lies the legacy mainframe, often TPF-based, which powers core operational and transactional workloads. For decades, these systems delivered unmatched reliability. Today, they have become a strategic bottleneck.

Airlines attempting incremental modernization have discovered hard truths:

### Talent erosion:

Engineers with deep TPF and mainframe expertise are retiring, making skills scarce and costly.



### Operational rigidity:

Monolithic architectures resist modular change and slow down innovation cycles.



### Data fragmentation:

Real-time decisioning, AI-driven optimization, and personalization demand unified data, something legacy cores cannot deliver.



As a result, airlines face longer time-to-market, higher operational costs, and an inability to respond dynamically during disruptions. The gap between what customers expect and what systems can deliver continues to widen.

In response, many airlines attempted to modernize quickly by migrating these legacy workloads to the cloud without fundamentally changing their design.

## Why “Lift and Shift” Fails: The Frankenstein Effect

Many airlines initially pursued “lift-and-shift” migrations, moving legacy workloads to the cloud without re-architecting them. While this approach promises speed, it often results in a fragmented landscape of tightly coupled applications running on modern infrastructure but behaving like legacy systems.

This Frankenstein architecture creates:

- Higher cloud costs without flexibility
- Complex integrations and brittle interfaces
- Minimal gains in agility or innovation

True modernization is not about changing where systems run; it is about changing how they are designed, connected, and evolved. Airlines are now realizing that the real challenge lies in extracting business logic, mapping dependencies, and orchestrating across platforms.

These limitations have pushed airlines to move beyond one-size-fits-all modernization strategies and rethink how buy, build, and integration decisions work together



# Hybrid Modernization for Airline Platforms: Balancing Buy, Build, and Integration

True modernization is not about copying legacy systems into the cloud; it is about **orchestrating business logic, data, and decision flows** to support a more agile, resilient airline operating model. Without rethinking how platforms interact and evolve, cloud migration alone delivers limited flexibility, marginal cost benefits, and constrained innovation.

As airlines pursue modernization, they typically face a familiar dilemma:

- **Adopt pre-packaged COTS solutions**, accelerating deployment but often constraining differentiation and long-term adaptability
- **Build bespoke platforms**, preserving uniqueness but introducing challenges around speed, scalability, and economic sustainability

In practice, neither approach in isolation delivers meaningful transformation at scale. What airlines increasingly require is a **hybrid modernization approach**, one that balances modernization velocity, operational resilience, and business value.

This hybrid path combines the strengths of buy and build strategies:

- Leveraging proven COTS platforms for stable, mission-critical functions
- Developing custom capabilities where differentiation, intelligence, and agility matter most
- Orchestrating interactions across systems through standardized, event-driven integration

Rather than duplicating legacy behavior on modern infrastructure, the hybrid approach focuses on how systems collaborate, **how decisions propagate in real time, and how data flows seamlessly across the airline**. When executed well, it enables airlines to modernize progressively while reducing operational risk and laying the foundation for continuous innovation.

In practice, this hybrid approach shifts the modernization challenge from individual applications to how systems integrate, exchange data, and operate together in real time.

## Airline Modernization System and Nuances of Integration Modules

Let's take the example of a Flight Operations system, which serves as the central digital backbone that manages the end-to-end operational lifecycle of a flight.

It typically comprises modules such as flight planning & dispatch, crew management & rostering, aircraft assignment, aircraft maintenance planning, operations control center (OCC), airport & ground operations covering load control, station & gate management, safety & compliance and analytics.

These modules continuously exchange data in real time. Eg: flight plans drive aircraft tail & crew assignments; the crew module updates rosters; the OCC monitors flights in real time; disruption management drives aircraft & crew optimizations; while safety modules validate regulatory compliance.

Listed below are some of the key integration and data flow touchpoints:

**Flight Planning ↔ Aircraft Assignment & Crew Management** for Tail number allocations & Crew rosters

**OCC ↔ Aircraft Maintenance** for Aircraft availability and defects reconciliation with operational control to avoid unsafe dispatch

**PSS ↔ Load Control** for Passenger counts and baggage, cargo & other details for weight & balance.

**Load Control ↔ OCC** for load sheets and weight & balance

**OCC ↔ Aircraft Assignment & Crew Management** for aircraft & crew allocation optimizations

**OCC ↔ Safety management** for incidents and safety reports

**Aircraft Maintenance ↔ MRO** for MEL/CDL information and maintenance status



Apart from the data exchange within FOS modules, the flight operations system also integrates with other airline internal systems such as the Airline Scheduling system, Passenger Service System (PSS), Departure control system (DCS), MRO and Finance/ERP, as well as external systems such as ATC, Airport systems, and regulatory authorities.

Therefore, the result is a highly complex, interconnected ecosystem where accurate, timely data flows are critical to keeping flights on time, safe, cost-efficient, and compliant with all regulations & best practices. This tightly coupled, real-time ecosystem makes modernization inherently complex, where even small integration gaps can cascade into operational, compliance, and customer-impacting issues.



## Key Challenges and Considerations for Modernization

As shown above, Flight operations depend on real-time, interconnected decisions across multiple modules and domains. While there are many COTS products which specialize in specific functions (like flight planning, load planning, crew operations & OCC), **each product system also brings its own integration standards (e.g., IATA AIDX, FIXM, XML, JSON), and data model.**

Let's look at some of the key challenges that are typically faced when adopting such a multi-product and hybrid approach:

Key Challenge	Description
<b>Integration Complexity &amp; standardization (across airline internal and external systems)</b>	Different product modules typically use different industry standards (IATA XML, AIDX, FIXM), and this requires a translation & events layer to transform product-specific events to airline-recognized format
<b>Real time sync</b>	<p>OCC decisions (e.g., aircraft swap) require real-time communication &amp; split-second updates.</p> <p>Real-time data sync across modules for aircraft, crew decisions, load control, etc., is essential, and any lag can disrupt operations and create a cascading effect.</p>
<b>Data consistency &amp; Master data management</b>	<p>There will be a need for a single source of truth and for proper data mappings, e.g., crew IDs and tail numbers across both bought and built-in systems.</p> <p>Duplication risks can arise when the same data is stored differently in vendor vs. custom databases, potentially leading to mismatches in operational decisions.</p>
<b>Data Regulatory Requirements</b>	OFPs, Crew duty records, MEL/CDL usage and incident reporting need to align with FAA/EASA/ICAO standards. Further, logging is extremely critical as inconsistent logs can expose the airline to audit risks.
<b>Minimizing Operational Disruption during Transition</b>	<p>It will be necessary to run the <b>old and new systems in parallel</b> for some time to minimize operational risk.</p> <p>While analytics and compliance rely on historical data, OCC needs live feeds. So, it is also extremely critical to ensure data integrity.</p>
<b>Maintaining systems Resiliency &amp; standardizing security practices</b>	Different products and custom-built applications may not have the same SLA and disaster recovery standards, and there will be a need to standardize security standards & controls across all systems.

**From the above, it is evident that without a secure design and a robust integration strategy, airlines can risk creating data silos, data integrity issues, manual processes and delays in real-time data flow, thereby ultimately hindering timely and informed decision-making.**

# The AI Inflection Point: From Manual Integration to Intelligent Orchestration

This is where Generative AI and Agentic AI fundamentally change the modernization equation.

## How GenAI Accelerates Modernization

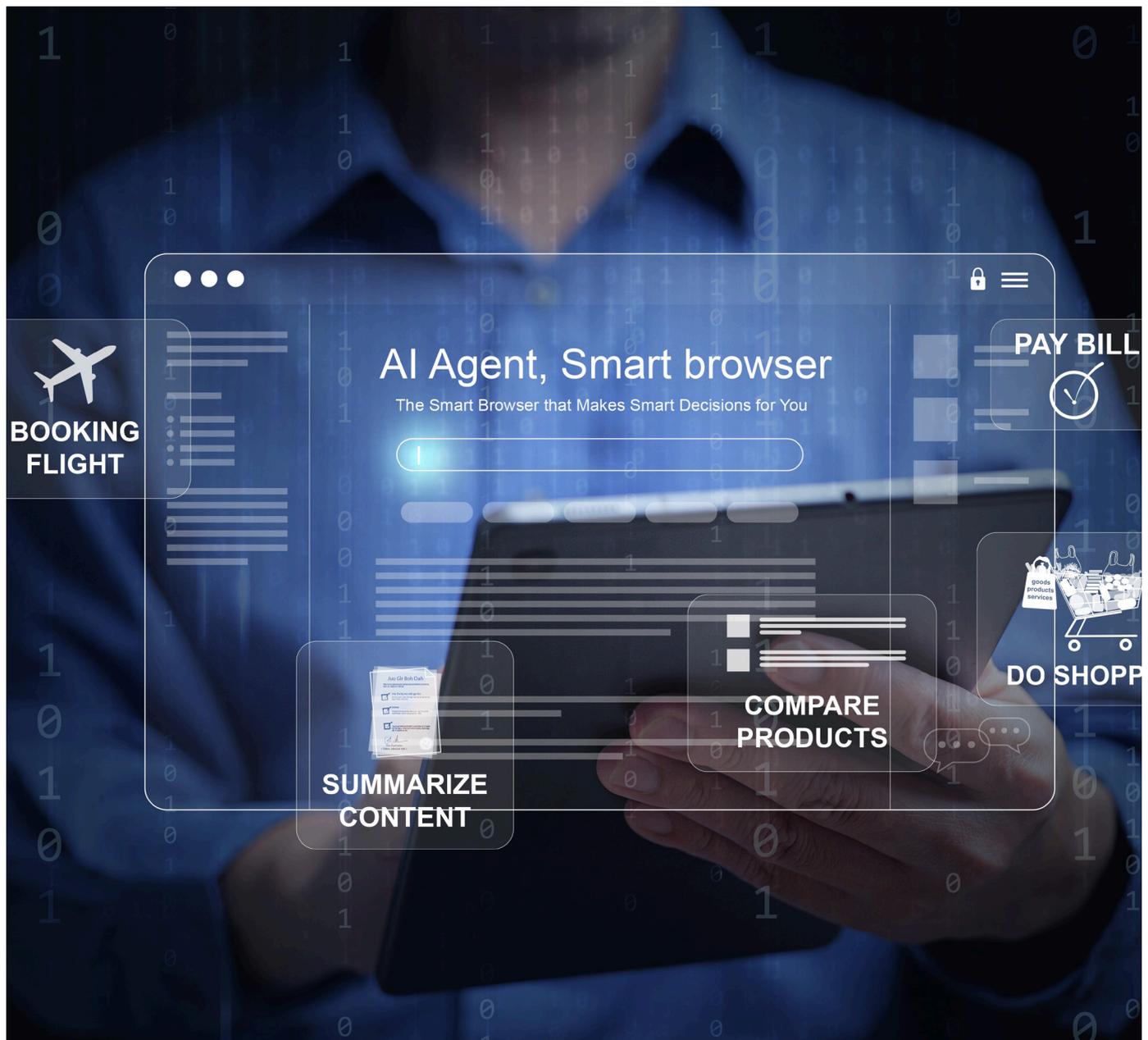
- Automatically reverse-engineers legacy code and documentation
- Extracts business rules and requirements
- Generates data mappings, integration logic, and test cases

## How Agentic AI Transforms Operations

- Continuously monitors integration pipelines
- Detects data breaks and latency issues
- Self-corrects workflows across FOS, PSS, MRO, and airport systems

Together, GenAI and Agentic AI shift airlines from brittle, manual integration to adaptive, self-healing platforms.

However, applying these AI capabilities to mission-critical airline platforms demands a disciplined approach, one that prioritizes understanding existing systems before transforming them.



## How Coforge Has Been Shaping Airline Platform Modernization

With over three decades of experience partnering with global airlines, Coforge has seen firsthand why large-scale platform modernization succeeds or fails. Across complex, always-on operational environments, the differentiator is rarely the choice of technology alone, but the ability to decode legacy complexity, preserve embedded operational intelligence, and modernize without destabilizing live operations.

This perspective has shaped Coforge's modernization philosophy, one that prioritizes blueprinting before rebuilding, orchestration over replacement, and outcomes over isolated system upgrades. It is from this experience-led viewpoint that Coforge approaches airline platform transformation, combining deep domain expertise with AI-led methods to reduce risk and enable scalable modernization.

## Forge-X: Blueprinting Airline Platforms Before Rebuilding Them

Forge-X is Coforge's AI-led modernization approach designed to address one of the most underestimated risks in airline transformation: modernizing systems without fully understanding what they do today. In airline environments, decades of operational logic governing dispatch, crew legality, disruption handling, and compliance are deeply embedded in legacy platforms, often undocumented and tightly coupled across systems. Forge-X focuses on uncovering this institutional knowledge upfront, creating a clear blueprint before any migration or re-architecture begins.

By combining airline domain expertise with Generative AI and Agentic AI capabilities, Forge-X helps airlines reconstruct business logic, identify hidden dependencies, and design an orchestration-led target architecture. This allows modernization to progress incrementally and safely, preserving operational continuity while enabling airlines to move toward more intelligent, resilient, and future-ready platforms.

## Conclusion: Reimagining Modern Airline Operations for an AI-Led Future

Modernization is not about replacing systems in isolation. It is about building intelligent, interconnected ecosystems.

Airlines that embrace AI-led, platform-centric modernization will gain resilience, speed, and sustainable competitive advantage.

### **Coforge's AI-Infused Modernization for Airlines**

Coforge brings three decades of airline domain expertise combined with AI-driven modernization accelerators, CodeInsightAI, APIMig+, Integration Studio, BlueSwan, and Quasar.

From complex platform migrations to enterprise-wide system integration, Coforge transforms airline ecosystems into intelligent, connected systems.

**Modernization is no longer optional.**

**The future airline is being built now, and it is intelligent, agile, and platform-driven.**



## About Coforge

Coforge is a global digital services and solutions provider, that leverages emerging technologies and deep domain expertise to deliver real-world business impact for its clients. A focus on select industries, a deep domain understanding of the underlying processes of those industries and partnerships with leading technology platforms, enables Coforge to be a trusted partner of its clients in their transformation initiatives. Coforge leads with its Product Engineering approach and leverages AI, Cloud, Data, Integration and Automation technologies to transform businesses into intelligent, high growth enterprises. Coforge has 33 global delivery centers and is present in 25 countries.

Learn more: [www.coforge.com](http://www.coforge.com)

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