

The background image shows an airport check-in kiosk. A person's hand is visible on the right, holding a smartphone and interacting with the kiosk's screen. The kiosk is white with a black screen. In the background, there are large windows and other airport infrastructure. The overall scene is brightly lit, suggesting a modern airport environment.

HEXAWARE

AI-Powered Legacy Modernization for a Leading US Airline

Reduced user story generation from 2 months to 1 day and architecture mapping from 1 month to 7 days, helping a leading global airline modernize a mission-critical legacy system faster, safer, and with greater confidence.

Case study

Client

| Client

- Challenge
- Solution
- Benefits
- Summary

A leading global airline

Our client is a leading global airline headquartered in the United States. With a vast network of domestic and international flights, they are known for their extensive flight routes, modern fleet, and commitment to delivering exceptional passenger service and comfort.



Challenge

Client

Challenge

Solution

Benefits

Summary

A high-risk legacy system where errors could disrupt operations at scale.

A legacy system, critical to the global airline's operations (crew scheduling, payroll, training, and FAA compliance), created significant risks due to its outdated nature. The system, Natural/Adabas mainframe, originally built decades ago with over 6 million lines of code, suffered from:

- **Complexity and lack of documentation:** The system was composed of decades of patchwork with dead code, undocumented dependencies, and legacy rules buried across hundreds of files. Only a few retiring subject matter experts (SMEs) understood parts of the system, and no single person had complete knowledge.
- **Zero-tolerance for errors:** Any mistake in the system (e.g., payroll miscalculations or scheduling errors) led to catastrophic consequences, such as FAA violations, grounded flights, union grievances, and lawsuits. The business and operations demanded absolute accuracy.
- **Failed modernization attempt:** A few prior modernization efforts had failed, costing years of time and millions of dollars.

Risk of undetected errors with cascading consequence:

- **Scheduling Risks:** Legacy formulas for calculating pilot hours posed a significant risk of miscalculation. These errors could lead to pilots being incorrectly marked as eligible for flights despite exceeding FAA flight-hour limits. Such missteps could result in FAA violations, grounded flights, and disrupted operations, leaving thousands of passengers stranded.
- **Payroll Risks:** Updates made to payroll rules in the legacy system were highly vulnerable to errors caused by deeply buried dependencies. For example, changes to payment clauses often required updates across multiple interconnected files. Missing even a single file could result in silent underpayments over an extended period, exposing the organization to lawsuits and significant financial losses.



Solution

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AI-powered modernization that mapped complexity, reduced risk, and accelerated change.

We used RapidX®, our proprietary agentic AI platform, to leverage Knowledge Graphs and call graph compilations to safely modernize, document, and optimize the legacy codebase. RapidX® provided:

Knowledge Graph:

- Mapped every node, dependency, and patch in the legacy system into a mathematically validated execution map.
- Identified dead code, ripple effects, and undocumented rules, turning tribal knowledge into queryable, digitized documentation.

Ripple Effect Analysis:

- Traced and validated every interdependent file or rule, ensuring no links were missed when making updates, thereby reducing the risk of errors.
- Prevented silent failures by instantly mapping dependencies for changes like union contracts or overtime rules.

Grounded Rule Extraction:

- Extracted business rules directly from the codebase and linked them to external regulations (e.g., FAA compliance) and union contracts, ensuring accuracy and legal alignment.

Accelerated Modernization:

- Automated architecture mapping reduced manual SME dependency, enabling faster and safer modernization.
- Validated new code against legacy execution paths to ensure compliance before deployment.

Human + AI Governance:

- RapidX® combined AI-driven system intelligence with continuous expert validation, ensuring modernization decisions were transparent, accurate, and aligned to business and regulatory requirements.



Benefits

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Faster modernization, reduced risk, and lasting operational confidence.

Faster Modernization:

- Reduced user story generation from 2 months to 1 day, with context-rich, auto-generated documentation.
- Decreased architecture mapping time from 1 month to 7 days.
- Enabled safe identification and removal of dead code within hours.

Permanent Knowledge Retention:

- Transformed undocumented tribal SME knowledge into a permanent, queryable Knowledge Graph.
- Linked rules and calculations to their original sources (e.g., union contracts), ensuring long-term compliance and auditability.

Increased Trust and Collaboration:

- Continuous feedback loops with the client ensured rigorous validation, creating a solution that was both precise and reliable.
- Enabled the client to move from fear of system changes to confident modernization efforts.



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Modernizing a mission-critical airline legacy system with AI-driven precision, compliance, and speed.

Hexaware helped a leading global airline modernize a mission-critical legacy system supporting crew scheduling, payroll, training, and FAA compliance. Built on a decades-old Natural/Adabas mainframe with over 6 million lines of code, the platform carried significant complexity, undocumented dependencies, and high operational risk.

Using RapidX®, Hexaware’s agentic AI platform, combined with expert-led validation, we applied Knowledge Graphs, dependency analysis, and business rule discovery to improve system visibility, reduce modernization risk, and accelerate change. The result was Natural/Adabas modernization with faster transformation planning, stronger operational confidence, preserved institutional knowledge, and a clearer path to long-term modernization.



Have questions or want to learn more?
Write to us at marketing@hexaware.com

About Hexaware

Hexaware is a global technology and business process services company. Every day, Hexawarians wake up with a singular purpose: to create smiles through great people and technology. With this purpose gaining momentum, we are well on our way to realizing our vision of being the most loved digital transformation partner in the world. We also seek to protect the planet and build a better tomorrow for our customers, employees, partners, investors, and the communities in which we operate.

With offices across the world, we empower enterprises to realize digital transformation at scale and speed by partnering with them to build, transform, run, and optimize their technology and business processes.

Learn more about Hexaware at <https://www.hexaware.com>.

Get in touch