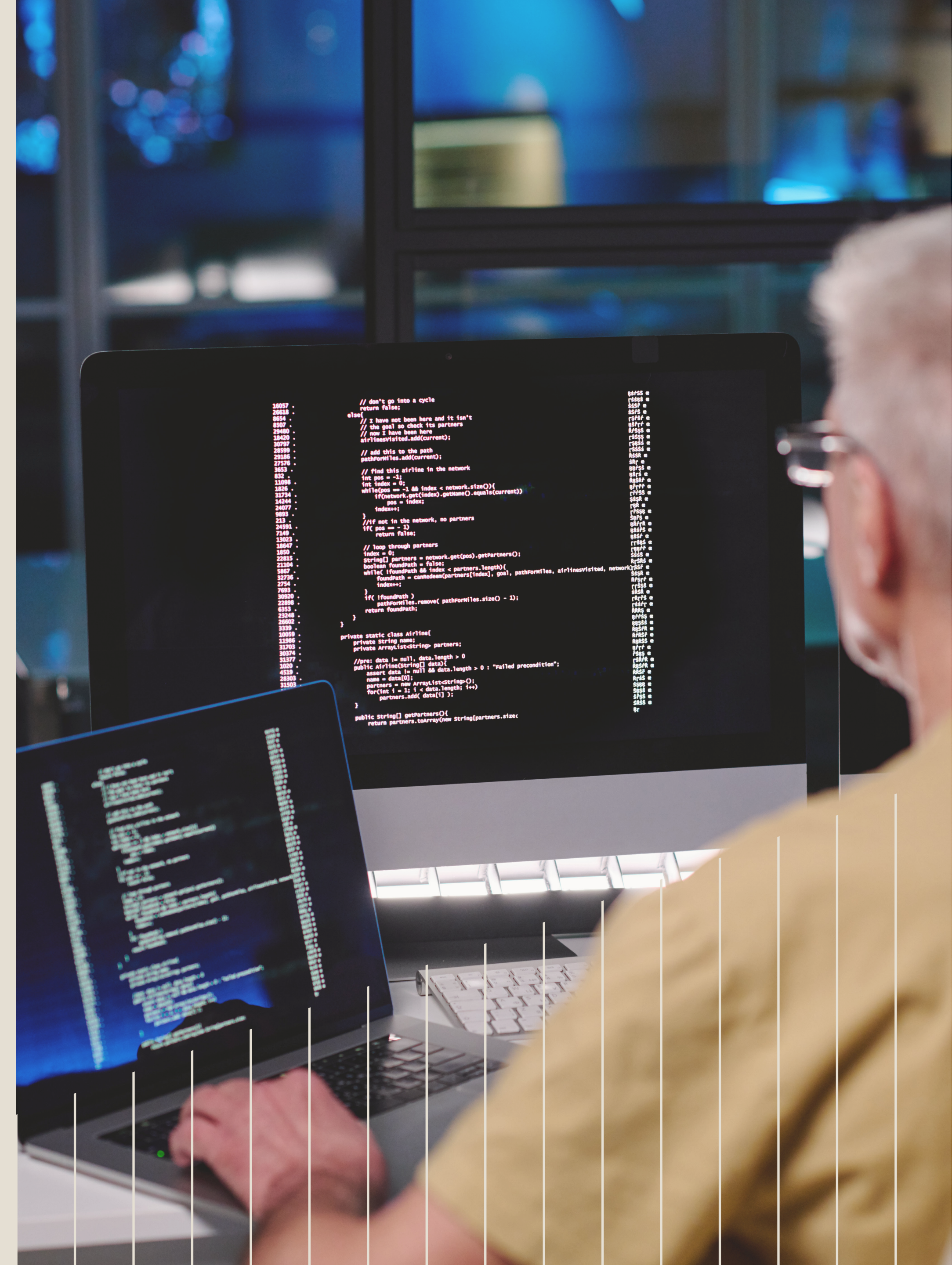Case Study

Leading North American Automotive Enterprise Accelerates Legacy Java Modernization with Amazon Q Developer.

Overview

Modernizing mission-critical Java applications at enterprise scale requires innovation while managing risks related to disruption, dependency conflicts, and operational instability. Traditional transformation approaches are slow, manual, and often introduce security, performance, and compliance challenges.

A leading North American automotive enterprise found itself navigating these challenges in a high-stakes Java modernization initiative. With over **500K lines of legacy code and thousands of daily users** relying on the system, the modernization effort needed to balance velocity, precision, compliance, and future readiness. In partnership with AWS, Tech Mahindra leveraged **Amazon Q Developer**, an AI powered development assistant, to deliver a smarter, faster, and more reliable modernization journey.

Client Background and Challenges

The client is a renowned North American automotive enterprise, operating several core business functions on Java 8–based applications. The enterprise sought to upgrade its systems to Java 21 ensuring uninterrupted operations.

The challenge was far more extensive than a version upgrade. It required:

Legacy API Migration: Replacing deprecated Java 8 APIs with modern Java 21 constructsmodern Java 21 constructs.

Dependency conflicts: Updating Spring Boot, Hibernate, and other libraries without breaking runtime stability.

Security Reinforcement: Addressing vulnerabilities and aligning with modern security practices.

Performance Optimization: Improving system responsiveness and runtime efficiency.

Testing and Validation: Achieving **92% JUnit test coverage** to ensure functional integrity.
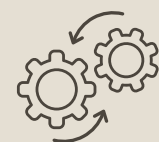
All this needed to be completed without disrupting ongoing business operations.

Solution and Approach

We embraced Amazon Q Developer asan AI-based collaborative partner to accelerate and derisk the modernization effort. Rather than relying on extensive manual refactoring, the team used AI guided modernization workflows to migrate, optimize, and validate large portions of the codebase.following capabilities:

Key Capabilities Leveraged

API Modernization

Migrated deprecated Java 8 APIs to Java 21 compliant patterns.

Test Automation

Auto generated JUnit test cases that helped achieve **92% code coverage**, accelerating validation and reducing regression risk.

Dependency Updates

Upgraded frameworks including **Spring Boot, Hibernate, and Apache Commons** to stable, secure versions.

Resolved dependency conflicts through AI assisted recommendations.

Security Hardening

Detected and addressed security risks, including **SQL injection and unsafe deserialization.**

Performance Tuning

Optimized SQL queries and stream operations for better runtime performance.

Identified and removed bottlenecks through AI driven insights.

Business Impact

The strategic effort delivered tangible gains across operations, resulting in:

Reduced Manual Effort

AI-assisted moderenization reduced manual migration effort by 30%, lowering delivery risk and accelerating execution.

High Code Acceptance Rate

Over 60% of AI-recommended codes were accepted without modification, expediting the modernization process.

Accelerated Testing Cycles

Automated test generation enabled 40% faster test creation, reducing validation timelines and regression risk.

Improved Developer Productivity

Achieved a 35% increase in productivity driven by reduced manual refactoring and enhanced automation.

Enhanced Code Quality and Compliance

AI augmented refactoring resulted in a 45% improvement in code quality, strengthening system stability and compliance posture.

About Tech Mahindra

Tech Mahindra (NSE: TECHM) offers technology consulting and digital solutions to global enterprises across industries, enabling transformative scale at unparalleled speed. With 149,000+ professionals across 90+ countries helping 1100+ clients, Tech Mahindra provides a full spectrum of services including consulting, information technology, enterprise applications, business process services, engineering services, network services, customer experience & design, AI & analytics, and cloud & infrastructure services. It is the first Indian company in the world to have been awarded the Sustainable Markets Initiative's Terra Carta Seal, which recognizes global companies that are actively leading the charge to create a climate and nature-positive future. Tech Mahindra is part of the Mahindra Group, founded in 1945, one of the largest and most admired multinational federation of companies. For more information on how TechM can partner with you to meet your Scale at Speed™ imperatives, please visit https://www.techmahindra.com/.

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