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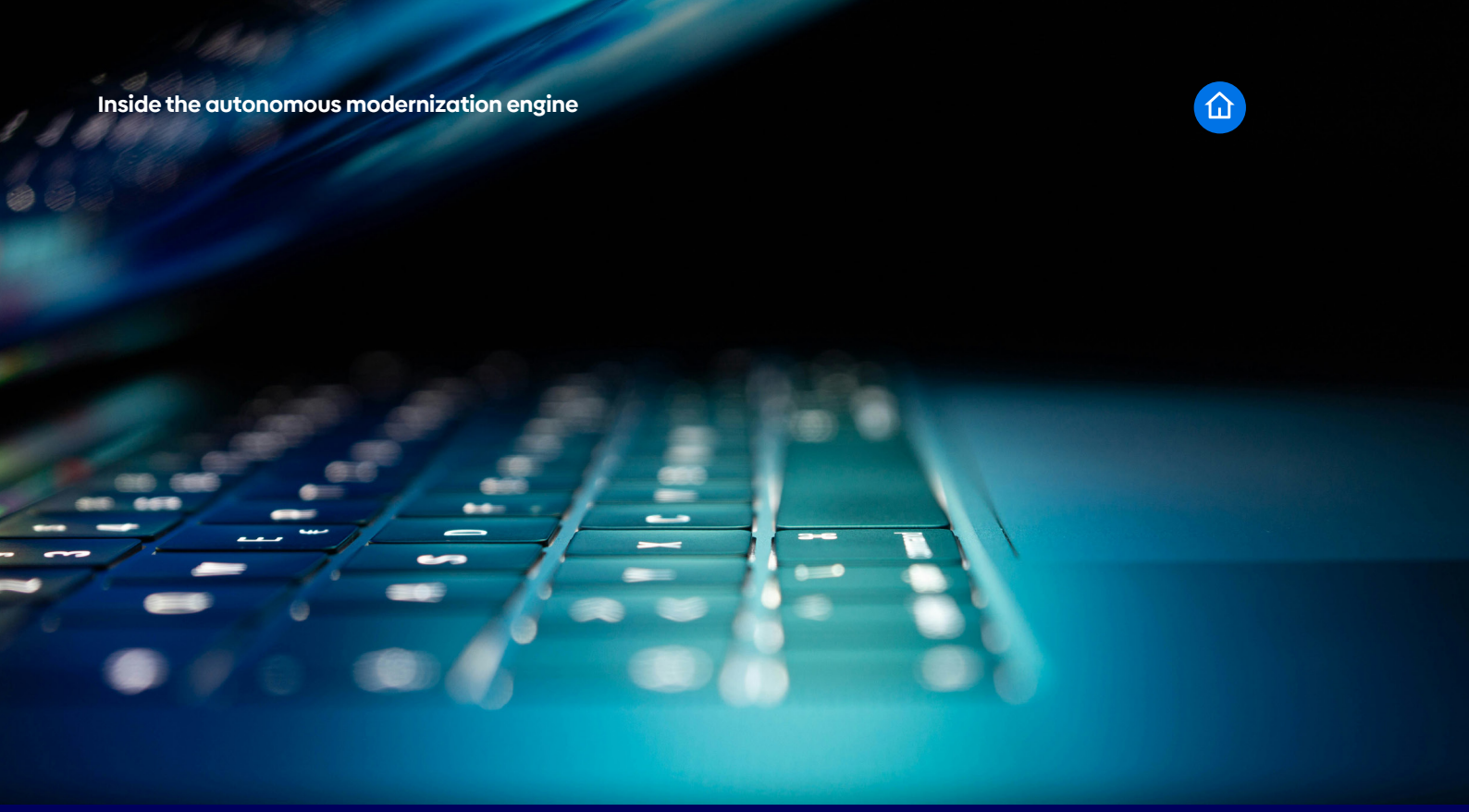
Inside the autonomous modernization engine:

How AI and automation are rewriting the rules of transformation

For decades, legacy application modernization has been slow, complex, and high-risk. Traditional approaches often involved the painstaking reading of old code and the manual rewriting of thousands of lines, hoping that nothing would break along the way.

Today, that model is being replaced. AI and intelligent automation are transforming the process, giving rise to modernization accelerators such as our Digital Transformation Engineer: an AI-powered engine that can handle much of the heavy lifting. The Atos Digital Transformation Engineer, deployed on Azure, demonstrates how this approach makes application transformation faster, safer, and more predictable.

Generative AI and automation are doing for software modernization what assembly lines did for manufacturing: improving speed, consistency, and the rules of how work gets done.



What does AI-powered modernization really mean?

AI-powered modernization uses advanced models and automation to analyze, convert, and validate code automatically. Large language models (LLMs), the same family behind tools such as ChatGPT, read legacy systems while robotic automation executes repetitive tasks at scale. Recognized by Gartner as a key trend, 'Agentic AI' describes autonomous AI agents that are increasingly being used to accelerate complex modernization and transformation initiatives

How does the Atos Digital Transformation Engineer work?

01.
AI-driven analysis: understanding legacy systems

Modernization begins with understanding your applications' purpose. In the past, this meant combing through outdated documentation. Today, AI can scan code, databases, and configuration scripts automatically. Atos' accelerator combines Azure OpenAI and custom orchestration to identify dependencies, business logic, outdated libraries, and technical debt hotspots.

Natural language generation creates documentation that can be readily consumed by IT teams, including flow charts and summaries. For example, an auto-generated report might explain: "Module X handles customer billing; it interacts with table Y and is invoked by process Z." This approach uncovers hidden dependencies even experienced developers might miss. Tools such as Atos' Application Cloud Assessment Tool (ACAT) also recommend whether to refactor a module for cloud deployment or replace it with a SaaS solution.

By illuminating legacy systems, AI enables informed decisions about which components to modernize, replace, or retire.

02.
Automated refactoring: transforming code at scale

Once systems are understood, they need to be modernized. Traditionally, this meant manual recoding or slow find-and-replace processes. AI-powered platforms can handle the bulk of conversion automatically, transforming legacy code into modern languages or cloud-ready architectures. This may involve converting COBOL to Java, or PL/SQL to Azure SQL, or breaking a monolithic application into microservices.

The Atos Digital Transformation Engineer uses rules derived from Atos' rich infrastructure experience, augmented by AI to handle unique cases. It interprets business logic and produces equivalent modern code, acting as an expert translator.

Automation is highly effective: it often achieves 80–90% code conversion. For instance, a global airline converted over 70 Oracle procedures to a cloud-ready format in 2.5 weeks, a task that might have taken months manually. A financial services firm reduced a 15-month project to 7 months thanks to automated refactoring.

Human expertise remains crucial: developers supervise AI, refine complex code, make design decisions, and validate architecture. This collaboration produces faster, more consistent, and cleaner code, reducing errors and creating modular, maintainable applications.

03.
Intelligent validation: quality assurance at scale

A major concern in modernization is 'breaking' the business. AI changes the process by enabling automated testing and validation. The platform generates test cases from legacy logic, runs unit and regression tests—and flags any discrepancies or areas of concern for engineers to review.

AI also checks code quality, security, and compliance. This means legacy vulnerabilities can now be addressed during refactoring. Sensitive data handling and regulatory requirements, such as GDPR, are automatically validated. Atos' platform also incorporates built-in guardrails for both security and architecture so that modernized systems meet cloud best practices and compliance standards.

This intelligent validation reduces post-deployment issues dramatically. Some projects report zero critical incidents after go-live, turning traditionally high-risk transformations into predictable, controlled processes.

Faster, safer, smarter transformation

The combination of analysis, refactoring, and validation delivers measurable results.

Organizations using this agentic approach experience:

Speed: Transformation timelines are often cut by half or more. Multi-year backlogs can be cleared in months.

Cost-efficiency: Automated code conversion reduces developer hours, sometimes cutting project costs by 50%.

Safer modernization: AI-assisted QA identifies issues early, lowering risk for critical systems and improving reliability.

Enhanced security and compliance: Vulnerabilities are addressed during modernization, and new systems are cloud-hardened from day one.

Knowledge transfer: AI-generated documentation provides insight for IT teams and business stakeholders, reducing key-person risk and simplifying future changes.

The Atos Digital Transformation Engineer has been applied in diverse sectors, modernizing IBM Mainframe, COBOL, .NET, and Oracle systems. Results include 80% productivity gains and 65% faster time-to-market. For example, a healthcare provider halved data storage costs while moving to a scalable cloud-native system.

AI and human expertise: a practical partnership

AI does not replace human developers. Maximum value comes from human–AI collaboration: our agentic modernization engineer works like a highly capable team member—fast, precise, and tireless—but guided by human expertise. AI handles repetitive, high-volume tasks while developers focus on the most critical or creative parts of the code. Architects validate AI recommendations against business strategy and enterprise standards.

Modernization dashboards show AI-generated insights for each system: automation potential, estimated effort, and recommended actions. Leaders can make data-driven decisions, monitor progress in real time, and forecast outcomes such as cost savings, performance improvements, and environmental benefits from retiring old servers.

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From risk to opportunity

AI-powered modernization transforms legacy systems from obstacles into platforms for innovation. Human expertise combined with AI enables organizations to modernize core applications with minimal disruption, unlock cloud and digital capabilities sooner, and create a foundation for AI-enabled services and analytics.

For CIOs and IT leaders, modernizing legacy systems no longer need to be risky, slow, or expensive. The autonomous modernization accelerator acts as a discovery engine, code converter, and quality analyst. It makes transformation faster, safer, and more predictable.

AI-powered analysis, refactoring, and validation turn transformation into a controlled data-driven process. Organizations can move to the cloud faster, adopt new digital capabilities sooner, and leverage modern systems as the foundation for innovation.

Faster, safer, and smarter modernization is already a reality. The agentic approach is practical, proven, and ready to help organizations turn legacy systems into launchpads for future growth.

Discover the Atos Digital Transformation Engineer

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About Atos

Atos Group is a global leader in digital transformation with c. 72,000 employees and annual revenue of c. € 10 billion, operating in 68 countries under two brands — Atos for services and Eviden for products. European number one in cybersecurity, cloud and high-performance computing, Atos Group is committed to a secure and decarbonized future and provides tailored AI-powered, end-to-end solutions for all industries. Atos is a SE (Societas Europaea) and listed on Euronext Paris.

The purpose of Atos is to help design the future of the information space. Its expertise and services support the development of knowledge, education and research in a multicultural approach and contribute to the development of scientific and technological excellence. Across the world, the Group enables its customers and employees, and members of societies at large to live, work and develop sustainably, in a safe and secure information space.

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