



Accelerating mainframe modernization: An emerging role for generative AI

While mainframes remain central to many businesses, enterprises are at a critical inflection point: They must migrate and modernize mainframe workloads into cloud environments like AWS to accelerate digital transformation. But complexity is slowing down their progress. Generative AI has emerged as a critical asset for simplifying the process, helping to reduce risk and compress migration timeframes.

Cloud and other infrastructure environments dominate the modern IT landscape, yet mainframes continue to play a critical role in many transaction-oriented industries like banking, retail, and insurance. Major players are reliant on mainframes to run the systems that orchestrate core business functions, including distribution, manufacturing, billing, and credit card processing. Estimates are that 80% of enterprise data remains tied to the mainframe.

As enterprises adopt digital business models, they seek to modernize mission-critical systems while reducing their reliance on traditional mainframes. Mainframes are typically associated with high operating costs, data center dependencies, and a poor sustainability footprint. Coupled with their lack of agility, flexibility, and scalability is a limited ability to effectively power new digital experiences. It is also increasingly cost-prohibitive to adopt emerging technologies in a mainframe environment.

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These limitations and challenges are driving a spike in mainframe modernization. According to [Transparency Market Research](#), the mainframe modernization services market is estimated to grow 16.5% CAGR from \$23.5 billion in 2021 to \$108.9 billion by 2031. Banks, in particular, are ready to make the leap. An [Accenture banking survey](#) found 82% of respondents plan to move more than half of their mainframe workloads to the cloud over the next 2 to 5 years. The primary motivators for the move: speed and agility (43%), security (41%), and the ability to add new capabilities (37%).

“We are at a critical inflection point,” says Howard Hinman, Principal PDM at Amazon Web Services (AWS). “With the cloud, mainframe price increases, and all these disruptive technologies like generative AI coming to the fore, there’s a massive uptick in enterprises wanting to get off these platforms.”

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Mainframe modernization paths

As companies reassess their mainframe strategies, they must consider multiple modernization paths to transitioning critical systems and workloads to the cloud. There is no one-size-fits-all strategy for modernization. Organizations need to evaluate the following strategies based on metrics such as cost, business case, and appetite for risk.

- **Replatform**
Moves systems to a modern platform/operating system (commonly called lift and shift) without modifying the programming language. With this approach, applications can run in the AWS cloud using COBOL and PL/1.
- **Refactor**
Converts mainframe applications and systems from legacy code to a modern programming language like Java using semiautomated tooling.
- **Replace**
Calls for substituting a mainframe system with SaaS or a comparable commercial-off-the-shelf service.
- **Reimagine and rewrite**
Refreshing or updating mainframe applications for a modern cloud environment.
- **A hybrid approach**
A combination of any of these patterns architected according to application, business priority, and time-to-delivery requirements.

“There is not just one pattern, but rather what is the right pattern for the situation,” explains Joel Rosenberger, principal architect at Accenture. “It depends on the forward-looking direction of the client and their needs. That’s part of the assessment that needs to be done upfront.”

Even with the long list of benefits associated with mainframe migration and modernization, myriad barriers impede a smooth transition. The skills gap remains a critical issue given the shortage of experts versed in legacy mainframe technologies; what’s more, the pool of these experts continues to shrink as an aging workforce retires. With fewer mainframe experts in play, there’s a general lack of understanding of how legacy code works. As with any kind of major upgrade or migration effort, the risk of disruption to core business operations makes many enterprises hesitant to take the leap. There are also concerns over mainframe-to-cloud migration related to security and compliance risks.

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Top mainframe challenges

- **76%** High cost of operations
- **56%** Not flexible/adaptable
- **54%** Scarcity of mainframe skillsets among the workforce
- **46%** Challenges in integrating into new platforms and devops processes
- **34%** Aging mainframe workforce
- **33%** Unable to meet constantly changing business needs

Source: Accenture survey

Generative AI simplifies migration challenges

There is no magic button for migrating legacy mainframe systems to the cloud. But generative AI can facilitate the journey by simplifying and automating tasks. As part of their ongoing collaboration, Accenture and AWS are architecting mainframe modernization use cases and solutions powered by generative AI. And many organizations are already at work streamlining customer migration efforts, including the following:

- **Smarter decomposition:**
Modernizing mainframe applications involves breaking down large monoliths into modular services to align with business goals for maintainability and agility. Advanced analysis and visualization tools help identify dependencies, while generative AI can aid [processing large volumes of information](#) for optimal modernization.
- **Provable security:**
Mainframe core-business applications uphold stringent security, compliance, and regulatory standards. Automated reasoning, a discipline of AI, can aid in providing equivalent security controls for modernized applications during the security modernization phase.
- **Code documentation and improvement:**
During the reimagining of business functions, customers often encounter the need to manually extract and understand mainframe business logic and data models. This process, involving the definition of new requirements, typically relies on labor-intensive tasks, extending beyond existing automation capabilities. Generative AI, utilizing large language models, can streamline modernization efforts by parsing mainframe assets and generating relevant artifacts. This in turn reduces dependence on mainframe expertise and accelerates application reuse.
- **Data augmentation:**
Generative AI assists in data augmentation in multiple ways. This includes replicating data, generating test data, and augmenting decision-making. Generative AI's ability to generate synthetic data that closely resembles real-world data helps overcome any limitations associated with insufficient datasets for training.
- **Smart test generation:**
Modernizing mainframe applications involves extensive testing, consuming up to 70% of [project time and cost](#). Generative AI aids in test case creation across various dimensions, optimizing testing efficiency throughout the project lifecycle.



The AWS/Accenture partnership

Accenture and AWS have embraced a dual modernization approach to accelerate savings for customers. With this model, customers can move forward on a mainframe cloudification program, which runs mainframe applications on the cloud with minor code changes—in parallel with multiyear modernization programs that target new business functionalities while unshackling enterprises from the data center.

The mainframe cloudification workstreams can accelerate MIPS savings between 30% to 70% compared to mainframe spend for equivalent workloads, while maintaining or increasing performance. By decoupling the MIPS savings timeline from existing program dependencies, companies opting for the dual strategy approach can accelerate their path to savings.

“We work both strategies in harmony and have been successful showing clients we can support the modernization journey, not only from a financial point of view, but from a technology point of view,” Rosenberger says.

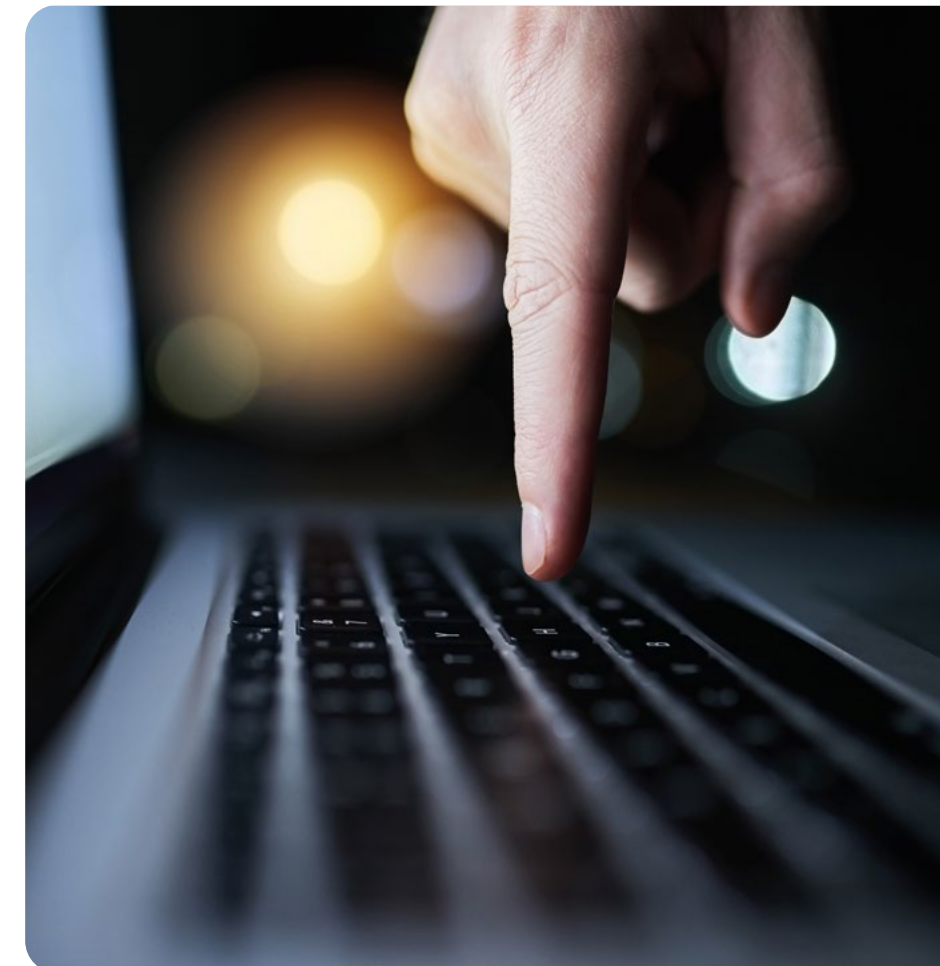
As part of their 15-year partnership, Accenture has completed 30,000 AWS certifications and boasts 30-plus competencies and service delivery designations, including AWS Mainframe Modernization. Both parties are co-investing in mainframe modernization technologies and services, including up to \$3 billion in cloud and infrastructure talent and services.

In particular, the acquisition of Blu Age by AWS, which is now part of the AWS Migration Acceleration Program (MAP), delivers a language migration toolkit that transforms legacy code to modern programming code with fully automated tooling. In another example, Rocket Software Enterprise COBOL and PL/1 solutions (formerly Micro Focus) is now embedded in AWS’s new Mainframe Modernization Managed Service, giving customers an accessible option for rehosting an application as-is, making zero or only minor changes to the application code.

The joint transformation program has completed 1,000 projects and migrated over 100,000 workloads to AWS. The partners emphasize efforts to derisk mainframe modernization and migration, including delivering services that span technical analysis, creating and prioritizing business cases, and developing wave plans to chart a customer-specific journey. Generative AI-powered practices are leveraged to conduct comprehensive discovery, develop data models, and break down monolithic mainframe apps into smaller, migratable components. Accenture and AWS will also assist clients in establishing governance and fostering cultural change—both critical aspects of successful mainframe modernization.

The typical ROI on mainframe modernization and migration projects can be quite significant. Platform spend can be reduced by 75% to 80%; IO costs come down in a similar ratio;

and there are other associated savings related to software and networking. In addition, savings can be reinvested in other efforts to accelerate application and data modernization. To ensure the highest levels of efficiency, Accenture and AWS work together to help clients create business cases and timelines depending on priorities.

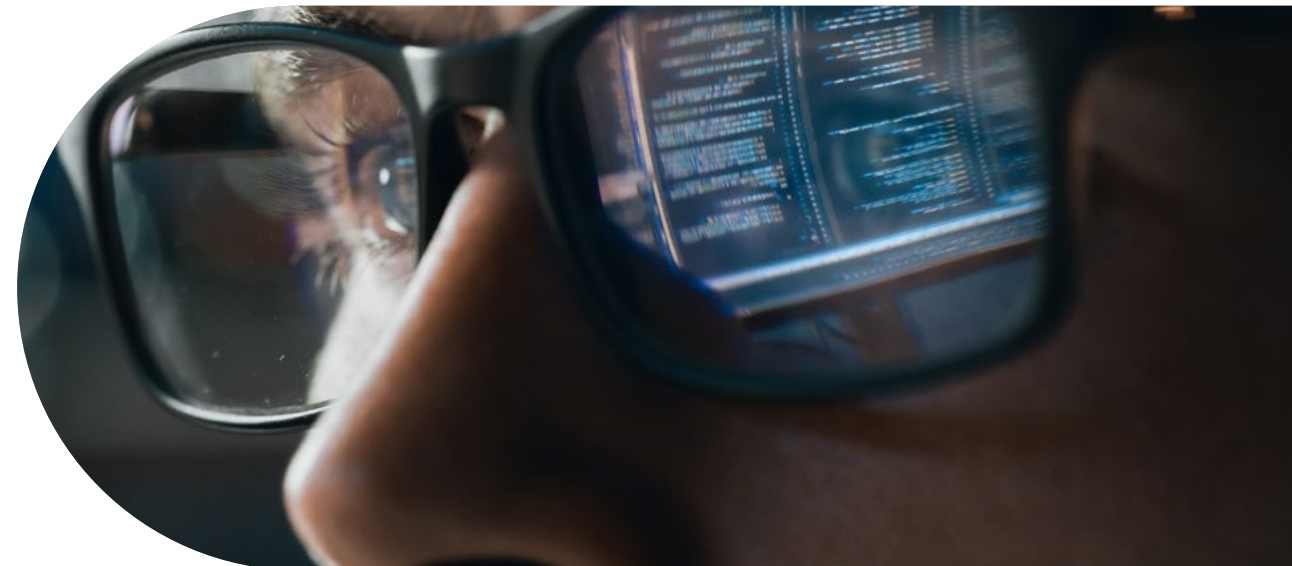
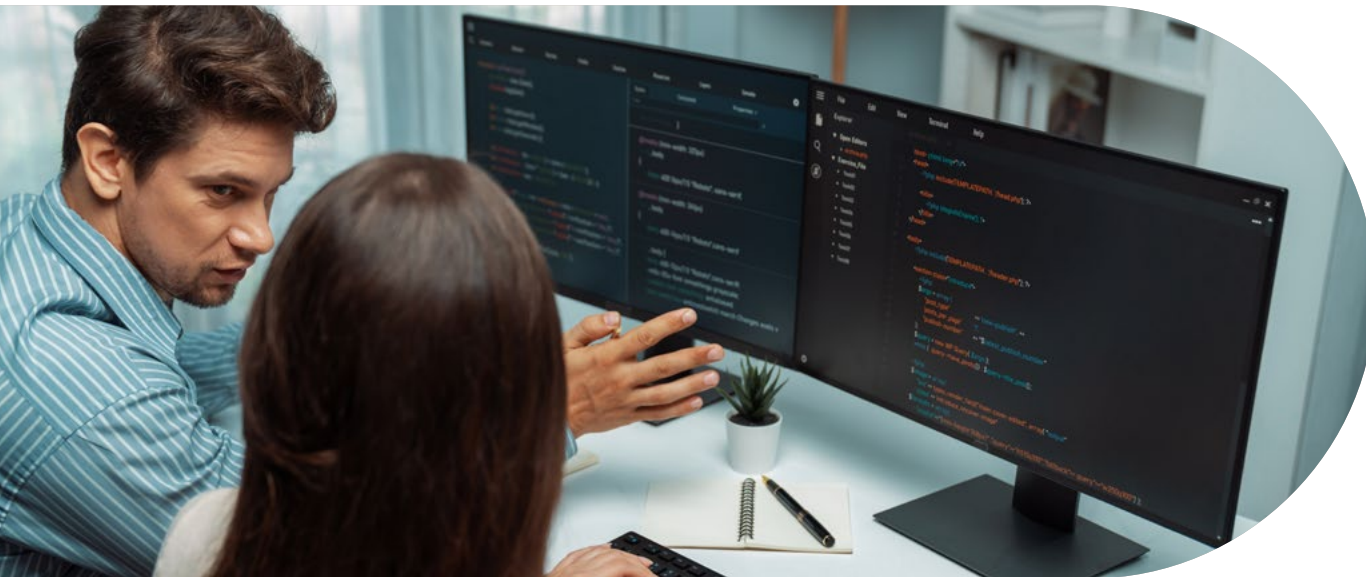


The bottom line

The time for mainframe migration and modernization is now. Cloud is the right platform for digital innovation and carbon footprint reduction. Accenture and AWS's collective services, intellectual property, and best practices, bolstered with generative AI intelligence and automation, are helping enterprises fast-track their long-awaited journey to the cloud.

For more information on the AWS and Accenture solution, visit:

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