



Modernizing Mainframes for What Comes Next

**An AI-enabled Path to
Modernization on AWS**



PROLOGUE



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Mainframe modernization has entered a new phase. While organizations continue to face familiar challenges such as rising costs, technical debt, aging skills, and the need for greater agility, AI is fundamentally changing what is possible. It is accelerating modernization, improving quality, reducing risk, and helping organizations realize value faster than ever before.

This shift marks a critical inflection point. Modernization is no longer simply about moving off legacy platforms. AI is redefining the journey in two fundamental ways: first, by unlocking and understanding decades of embedded business logic, applications, and data, dramatically accelerating analysis while reducing transformation risk; and second, by transforming those applications into the foundation of a more intelligent, adaptable enterprise powered by AI, automation, and cloud-native innovation. Realizing this opportunity requires more than technology. It demands deep mainframe expertise, AI-led execution, cloud-native engineering, and the ability to industrialize modernization at scale.

At Accenture, we approach modernization as an end-to-end transformation. Success depends not only on the tools used, but on knowing how, when, and where to apply them across discovery, business rule extraction, data migration, testing, deployment, and cutover. The expertise required to operate and maintain a mainframe is often different from the expertise needed to modernize applications and engineer cloud-native solutions. Accenture brings both, orchestrating the journey through a governed, integrated delivery model that combines deep mainframe knowledge, cloud-native engineering, and AI-powered execution to deliver predictable business outcomes.

AI is embedded throughout our modernization workflows, accelerating legacy system understanding, automating business rule extraction, generating test assets, and improving transformation quality at scale. Combined with architecture guardrails, human oversight, and disciplined engineering practices, it enables clients to move faster while maintaining compliance, business continuity, and operational stability.

Our partnership with AWS further amplifies these capabilities. Together, Accenture and AWS combine the power of AWS Transform with Accenture's composable AI agents, proprietary accelerators, modernization expertise, and industrialized delivery model. The result is a repeatable, governed approach that helps organizations scale modernization programs, accelerate outcomes, and reduce execution risk.

A key differentiator is our ability to deliver both early value and enterprise-scale execution. We focus on achieving measurable outcomes within the first few months, whether through reducing mainframe costs, enabling data access for analytics and AI, decoupling high-value workloads, or accelerating pilot transformations. At the same time, our global modernization talent, delivery hubs, reusable accelerators, and wave-based execution model help clients overcome skills shortages and modernize with confidence at scale.

Modernization is no longer just about leaving the past behind. Done right, it becomes the foundation for greater agility, faster innovation, and the ability to fully leverage AI across the enterprise. Organizations that modernize successfully today will be better positioned to compete, innovate, and grow tomorrow. Accenture and AWS are committed to helping clients realize that opportunity. We are pleased to present this Everest Group research, supported by Accenture, which explores the evolving path to AI-enabled mainframe modernization.



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Introduction

For decades, two scarce resources have constrained mainframe modernization: the knowledge required to understand the estate and the capacity to change it safely. Business logic is often spread across code, data, interfaces, batch processes, documentation, and operational knowledge, while tightly coupled dependencies make changes difficult to isolate and validate.

Modernization involves more than moving workloads to a new platform. Moving a workload from the mainframe to Amazon Web Services (AWS) may change where it runs, but it does not automatically make the business easier, faster, or less costly to change. Tightly coupled logic, brittle interfaces, and legacy dependencies can persist in the target environment. Enterprises must determine how custom applications, packaged platforms, data, middleware, schedulers, and interfaces should evolve together, and where AWS and the broader ecosystem can accelerate that transition.

AI is beginning to change the economics and feasibility of modernization. It can help

recover embedded knowledge and accelerate analysis, transformation, testing, and remediation. Its value extends beyond faster code generation: AI can increase the volume of modernization work companies can undertake while improving the evidence available to inform modernization decisions.

In this Viewpoint, we explore:

- What enterprises need to understand before committing significant modernization investments
- How modernization pathways differ across custom, packaged, and mixed estates
- How modernization can reduce the cost and complexity of future business change
- Where AWS and the broader ecosystem can accelerate modernization and where providers' capabilities remain necessary
- How AI-enabled modernization can be governed and scaled with appropriate evidence and controls

The modernization imperative

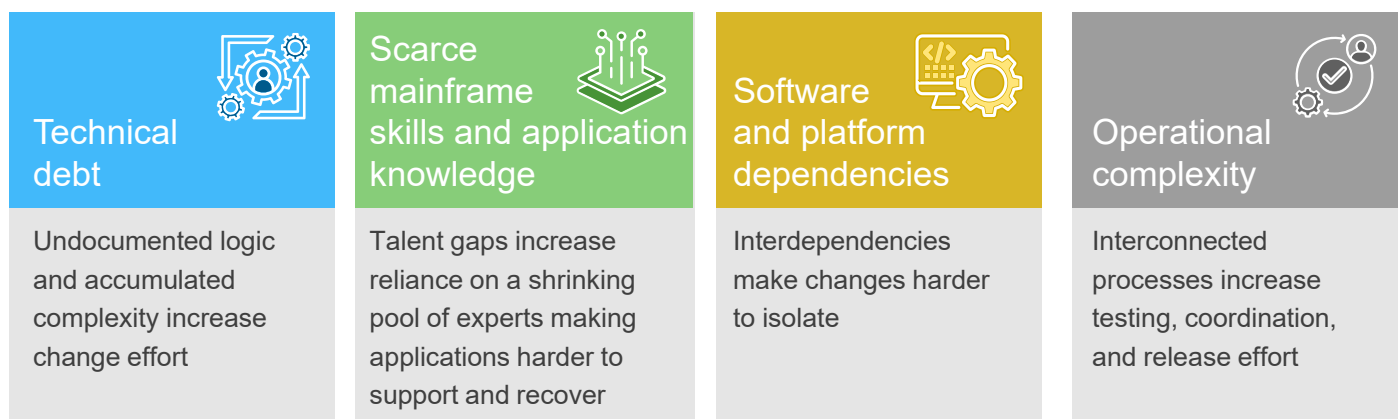
Mainframe constraints on change

Mainframes can continue to deliver the resilience, security, transaction integrity, and performance required for mission-critical workloads, even as the applications and operating environments around them become harder to change. Over time, business logic becomes harder to isolate, dependencies multiply, documentation becomes incomplete, and critical knowledge becomes concentrated among fewer mainframe experts. This creates operational fragility as well as change friction. When application or data issues occur, teams may take longer to diagnose and recover because fewer specialists understand the code, dependencies, batch logic, data structures, and recovery procedures. The underlying platform may remain resilient even as the applications running on it become harder to support and recover.

Exhibit 1 shows how four constraints reinforce one another, increasing the cost, risk, and friction of change across the mainframe estate.

Exhibit 1: Sources of change friction in the mainframe estate

Source: Everest Group (2026)



The cost of maintaining the status quo extends beyond slower change to greater concentration, application recovery, and business continuity risks. It manifests in slower releases, repeated integration effort, longer testing cycles, greater dependence on scarce mainframe expertise, and operational overhead from technologies that sit outside the broader engineering model. The modernization question increasingly centers on how much these constraints limit the enterprise's ability to change, rather than simply whether the mainframe continues to operate effectively.

AI readiness raises architectural rigidity

AI adds another dimension to this pressure. Applications increasingly need to expose data, business logic, and functionality to AI-enabled processes and cloud-native services while supporting faster, more automated engineering workflows. When business logic is difficult to understand, data is hard to expose, interfaces are brittle, and change depends on scarce mainframe expertise, the estate becomes harder to adapt to AI-driven requirements.

Everest Group research indicates that more than 50% of enterprises had already integrated gen AI into their modernization roadmaps, while enterprises pursuing in-place modernization also prioritized DevOps, data modernization, and API ecosystem enablement. This finding reinforces that modernization must do more than reduce infrastructure costs; it must also enable faster engineering, easier data access, and more flexible integration. AI readiness therefore raises the bar for what a modernized mainframe estate must enable.

Modernization pathways across custom, packaged, and mixed estates

Estate understanding as the first decision gate

Enterprises should not assign a single modernization pathway to an entire mainframe estate. Individual workloads can have very different business requirements, architectures, dependencies, economics, and rates of change. Enterprises should assess each workload independently before determining whether to retain, refactor, decompose, replace, or reimagine it. The target environment should not determine workload disposition. The modernization decision should separate two questions: what pathway is appropriate for the workload, and what target state should that pathway produce on AWS? Conflating the two can put technology choices ahead of the business and architectural outcomes the enterprise is trying to achieve. Modernization should therefore begin with a reliable fact base covering workload behavior, business logic, dependencies, operating controls, and remaining uncertainty.

Source code analysis provides only part of this picture. Job schedules, transaction definitions, database structures, runtime characteristics, security controls, and operational procedures can materially affect production behavior. Enterprises should combine application and architecture intelligence with operational, financial, security, contractual, and business-process context to understand how each workload operates, identify dependencies and cloud readiness, determine disposition options, and inform the roadmap and business case. Where evidence remains incomplete, uncertainty should remain explicit. This assessment should form the first decision gate in modernization.

Custom and packaged estates require different modernization pathways

Legacy portfolios typically combine internally developed applications, databases, interfaces, Commercial Off-the-Shelf (COTS) platforms, and years of enterprise-specific customization, often with dependencies that blur the boundaries between them. Applying the same modernization approach across such an estate risks either preserving existing constraints or removing capabilities that still matter.

For custom applications, the objective is to preserve valuable business logic without carrying forward the constraints around it. Reverse engineering should establish application behavior, dependencies, interfaces, and business rules before teams decide whether to refactor, decompose, or selectively reimagine the workload. Code conversion is a means, not the modernization objective.

Packaged estates require a different approach. Enterprises should distinguish capabilities intrinsic to the product from years of custom extensions, integrations, and workarounds. The path may involve reducing bespoke extensions, rationalizing interfaces, modernizing data access, upgrading or replacing selected modules, or moving some business capabilities outside the package altogether. The objective is not necessarily to replace the COTS platform, but to reduce the extent to which future business change depends on customizing it.

Mixed-estate sequencing and workload disposition

In practice, enterprises often modernize custom applications and packaged platforms together. In mixed estates, sequencing becomes as important as disposition. A bounded field-sprint cadence, a short assessment window, a time-boxed proof, and a defined delivery horizon allow sequencing and disposition decisions to be tested against a real workload before being committed across the estate. Custom applications, packaged platforms, data, interfaces, and business processes may modernize at different speeds, so dependencies and process continuity should determine which changes can occur together and which must remain coupled for longer. The modernization roadmap should reflect dependencies between custom and packaged components as well as the disposition selected for each workload.

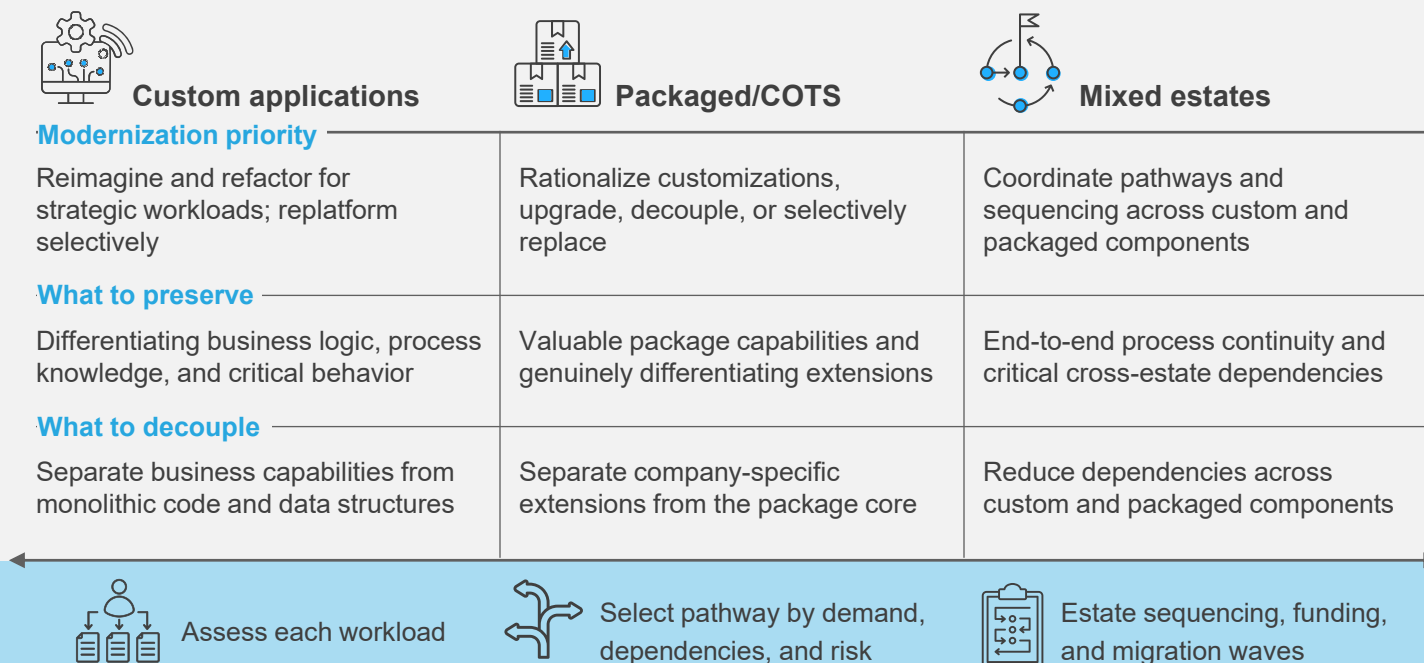
Exhibit 2 shows how modernization priorities and pathways differ across custom, packaged, and mixed legacy estates.

“We recognized that simply migrating from one technology stack to another would not be an optimal investment strategy. We required modernization.”

– VP of Product Development, a global enterprise software and services provider

Exhibit 2: Modernization pathways across custom, packaged, and mixed estates

Source: Everest Group (2026)



Transition architecture for mainframe-to-AWS modernization

Selecting a modernization pathway does not determine how the estate will operate during the transition. Applications, data, and processes rarely move together. Enterprises must therefore design the transition architecture as deliberately as the destination architecture.

Coexistence as a deliberate transition state

Mainframe-to-AWS modernization will typically proceed in waves, creating periods when business processes, data, and dependencies span both environments. Enterprises should design coexistence as a deliberate architecture state rather than allow it to emerge incrementally. The transition architecture should establish:

- Where business logic will execute and which system will remain authoritative for each material data domain during each wave
- Which interactions need to remain synchronous and which can become asynchronous, including required latency, ordering, and failure behavior

- How teams will move or synchronize data, in which direction, and how reconciliation will establish consistency
- How batch chains, calendars, restart behavior, and scheduler dependencies will operate when processing spans mainframe and AWS environments

The appropriate pattern will vary by workload. Transaction-intensive processes may require low-latency interaction with retained-mainframe capabilities, while other workloads can use events or replicated data to reduce runtime dependencies. AWS data migration capabilities, such as AWS Database Migration Service (AWS DMS), can support selected data-movement and coexistence patterns, while Amazon API Gateway and Amazon EventBridge can support API- and event-based interactions where those patterns fit the application architecture. Enterprises should validate tool coverage against the coexistence pattern. For example, AWS DMS supports full-load migration from IBM Db2 for z/OS but not Change Data Capture (CDC), so workloads requiring continuous replication may need another replication capability. The objective is to reduce unnecessary runtime dependencies while preserving the business and operational behavior that still matters. This is particularly important in mixed estates, where custom and packaged applications may modernize at different speeds.

Reducing change coupling across the estate

Modernization creates an opportunity to redraw boundaries between applications and capabilities. Enterprises can separate business functions from tightly coupled implementations, move company-specific extensions away from packaged cores, and progressively reduce dependencies without requiring every retained workload to move at the same time.

This creates architectural optionality by allowing parts of the estate to change independently where doing so creates value. Excessive decomposition, however, can introduce additional interfaces, network calls, operational dependencies, and failure modes. The right level of decoupling lowers the cost and risk of future change without making the estate materially harder to operate. A successful modernization program should reduce the cost of the next business change, not simply the cost of the current infrastructure.

Designing exit paths for interim states

As decoupling occurs progressively, enterprises will operate through interim hybrid states in which applications, data, and dependencies span mainframe and AWS environments. These arrangements may be necessary, but partially completed modernization can create a new form of technical debt. Every transition mechanism should therefore have a defined purpose, owner, and exit condition to prevent temporary solutions from becoming permanent.

Operations and resilience must also evolve with each wave. Enterprises need end-to-end visibility across retained and modernized components, including how failures propagate, how recovery dependencies span environments, and how rollback will work. AWS observability capabilities can support workloads on AWS, but the operating model must remain end-to-end across the hybrid estate.

Each modernization wave should reduce the dependencies that keep workloads tied to the transition state. The measure of progress is whether the enterprise can simplify coexistence, retire temporary mechanisms, and move more capabilities into a stable target-state architecture with each wave. The next question is how much autonomy the modernization model can safely support.

AI operating model for mainframe modernization

AI expands modernization capacity before automating transformation

The immediate opportunity for AI is strongest in activities that have traditionally consumed scarce mainframe expertise. A recent Everest Group survey indicates that 76% of enterprises were considering gen AI for legacy code understanding, compared with 48% for legacy code conversion.

This reinforces that the near-term opportunity is as much about expanding enterprises' capacity to understand complex estates as it is about automating transformation. AI's role differs by estate type. In custom applications, AI can operate more directly across code, logic, dependencies, and tests. In packaged environments, greater value may come from understanding extensions, interfaces, data flows, and process dependencies. Across both, the implication is the same: AI can take on more repeatable analytical work, while specialists focus on interpreting ambiguous evidence and making higher-risk modernization decisions.

However, more AI activity does not necessarily produce better modernization outcomes. Enterprises should assess whether AI-generated outputs are accurate, usable, and accepted by the next stage of modernization rather than measuring activity alone. The operating model should therefore vary not only in where AI is used, but also in how much autonomy it is given across different modernization activities.

Exhibit 3 translates this principle across five stages of modernization, showing how AI's role and the level of human oversight should vary as confidence increases.

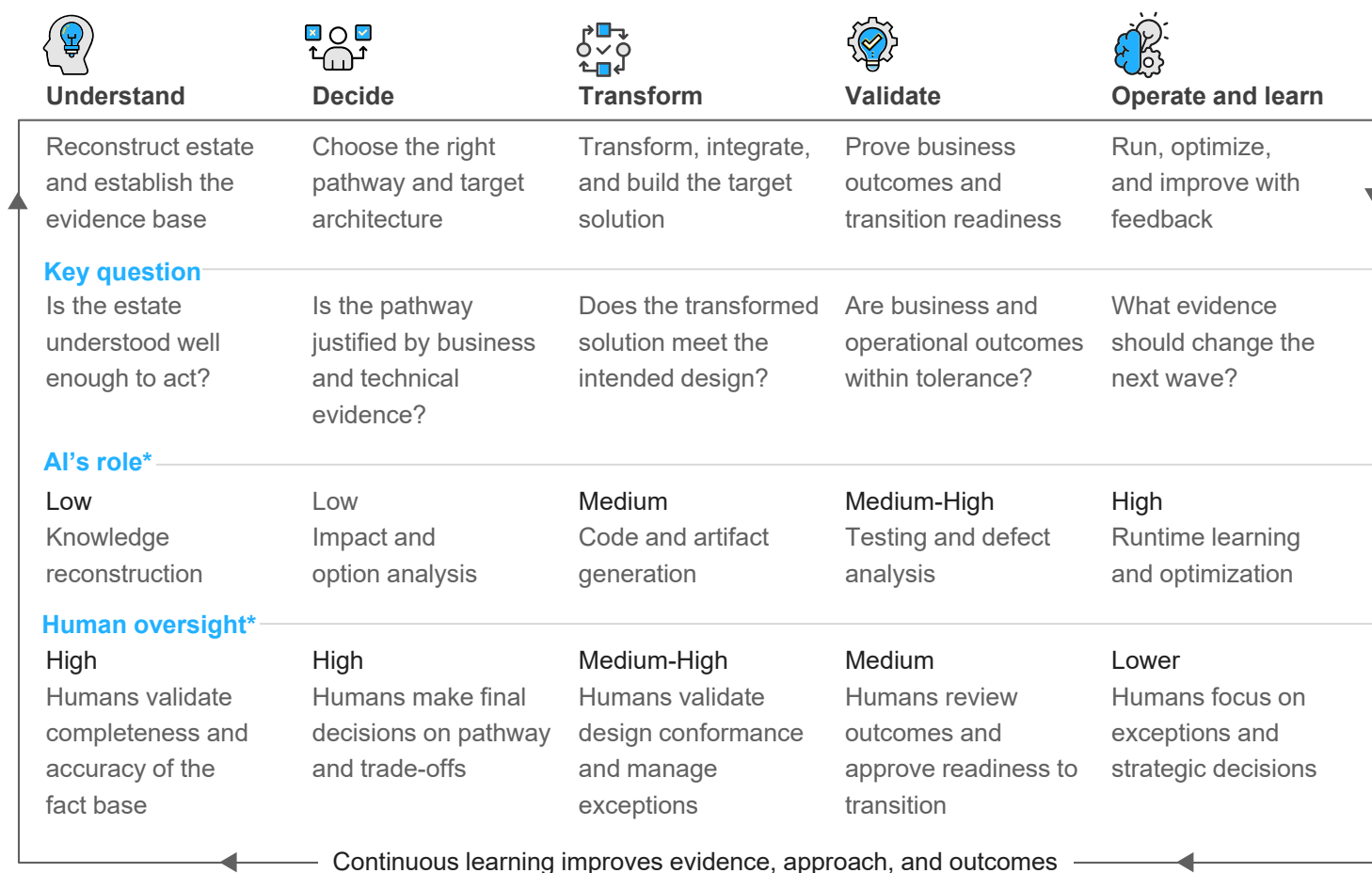
Everest Group take

AI can expand the amount of modernization work enterprises can undertake, but the value of greater automation depends on the quality of the evidence feeding it. In mainframe modernization, undocumented dependencies, incomplete business rules, and gaps between documented and actual runtime behavior can propagate through AI-enabled workflows.

The operating model should therefore increase AI autonomy only as evidence quality, validation, and reversibility improve. AI is most useful where modernization work is knowledge-intensive, repeatable, and capable of independent validation. Activities that are harder to reverse or carry a higher cost of error require tighter controls and stronger human oversight.

Exhibit 3: AI operating model for mainframe modernization

Source: Everest Group (2026)



Increasing autonomy according to evidence and reversibility

Not every modernization activity should operate at the same level of AI autonomy. Documentation, dependency analysis, and test generation can often be bounded and validated more easily than code transformation, architectural change, data migration, or production remediation. AI autonomy should increase only where evidence is sufficiently complete, outputs can be independently validated, and the cost of error remains within tolerance.

Purpose-built agents can reduce friction across stages, but handoffs should include source traceability, provenance, decision rationale, validation status, and known exceptions. An agent task is not complete when an output is generated; it is complete when the next accountable role can validate and use it safely.

Human judgment remains necessary at critical control points, including artifact completeness, pathway and architecture decisions, transformed-code acceptance, test evidence, and production release. Human oversight is therefore part of the modernization operating model, not a temporary limitation of current AI capabilities. AI can make that oversight more efficient by preserving traceability to source evidence, cross-checking outputs, and flagging exceptions for review while keeping accountable humans in control of higher-risk decisions. Governed agent registries can reinforce this model by making approved agents, lifecycle status, and controls more visible and auditable.

Wave-based delivery and progressive automation

Mainframe-to-AWS modernization should proceed in controlled waves. Validation should extend beyond functional equivalence to operational behavior, data consistency, performance, security, resilience, business acceptance, and rollback readiness.

Experience from each wave should inform how much automation is appropriate in the next. New workload types, weak documentation, or complex packaged environments should trigger stronger review. A successful wave should therefore improve both the transformed estate and the modernization model itself.

Scaling this model across a heterogeneous estate requires a broader modernization workbench: an execution framework that connects multiple capabilities without losing evidence, context, or accountability across handoffs.

Execution framework for mainframe modernization on AWS

The AI operating model determines where automation can be applied and how much autonomy it should have. Execution then depends on whether the capabilities involved in modernization can work together without losing the context and evidence established earlier in the program.

Maintaining decision traceability from discovery through validation

Modernization rarely runs through a single tool. Application understanding, architecture decisions, code transformation, data migration, testing, remediation, and transition may each require different capabilities. The execution framework should therefore keep business rules, dependencies, architecture decisions, exceptions, and acceptance criteria traceable as work progresses from understanding through engineering and validation.

This traceability starts with how the existing application is understood and documented. For supported mainframe workloads, AWS Transform's reimagine workflow can reverse-engineer source code, extract business rules, and generate application requirements while maintaining traceability to the underlying source. This provides one source of modernization evidence, but it needs to be considered alongside the broader operational and architectural context of the workload.

Runtime behavior, incidents, batch and scheduler dependencies, interfaces, data characteristics, security requirements, and target-state architecture can all affect how a workload should be transformed and sequenced. The execution framework should combine these inputs rather than treat application.

Orchestrating specialized capabilities around defined tasks

Mainframe modernization requires a composable execution model because no single tool will cover every language, platform, dependency, or engineering requirement. AWS Transform can provide modernization-specific capabilities, while composable agents, engineering environments, data capabilities, and OEM or specialist technologies can be added according to workload needs. Infrastructure such as AWS Agent Registry can add a governance layer to this composable model by providing a catalog for registering, discovering, and reusing agents, tools, and skills across teams. This may include agents operating through Amazon Bedrock AgentCore Runtime and engineering capabilities such as Kiro, Claude Code, or Codex connected through open protocols such as MCP so they can integrate with existing delivery environments rather than require a separate toolchain.

Composability allows enterprises to add or substitute capabilities without forcing modernization into a single-tool workflow or reconstructing evidence at every handoff. Business rules, assumptions, architecture decisions, validation status, and known exceptions should remain available as work moves between capabilities.

Provider differentiation extends beyond creating additional agents. It also lies in connecting architecture and forward engineering with testing, remediation, governance, and production accountability so that multiple capabilities operate as a single modernization process.

Within this model, specialized agents can perform bounded activities across the modernization life cycle. One agent may reconstruct business rules, another may support code transformation, and others may generate tests, analyze defects, or support remediation. Their value depends less on the number of agents involved than on whether subsequent activities can safely interpret, validate, and use their outputs.

Handoffs should retain source traceability, assumptions, decision rationale, validation status, and known exceptions. This allows downstream agents to cross-check outputs and enables human reviewers to trace generated conclusions to supporting evidence without manually reconstructing the analysis. Human oversight should remain embedded where outputs materially affect architecture, transformed code, data, testing, or production transition.

Iterative transformation and validation engineering

Enterprises should not treat AI-assisted modernization as a one-time conversion from legacy code to target code. It works best as an iterative engineering process in which analysis, transformation, testing, validation, and remediation continually inform one another. Transformation can expose missing dependencies, incomplete requirements, data issues, or differences between documented and observed behavior. Execution should therefore cycle through analysis, transformation, calibration, testing, and remediation, with evidence improving as the workload progresses.

This cycle extends beyond application code. Data may move incrementally; interfaces and batch processes may span mainframe and AWS environments; and some workloads may require synchronization, parallel operation, or dual running before cutover. Testing and remediation should continually refine the evidence used by the engineering workflow.

Validation must also keep pace with faster engineering. Enterprises may need to demonstrate functional equivalence, data reconciliation, batch and transaction behavior, integration, performance, security, resilience, user acceptance, and rollback readiness before a workload progresses. Demonstrated readiness, rather than a calendar milestone, should determine cutover. Teams should establish application quality, reconciliation, observability, operational readiness, security controls, business acceptance, and rollback viability before an irreversible transition. AI can assist with test generation and remediation, while AWS provides the target environment in which teams can test cloud-side behavior.

Neither substitutes for independent evidence that the workload behaves as intended. Generated output is an engineering artifact; validation provides the evidence required for modernization to progress. A composable execution framework should therefore keep workload understanding, engineering, testing, and validation moving at comparable speeds while preserving accountability across tools and teams. Otherwise, AI may accelerate individual activities without materially reducing overall modernization time or risk.

Managing modernization economics and value realization

The value case for modernization has three layers. AI can reduce the effort required to understand, change, and validate the estate. Moving to AWS can change infrastructure, resilience, and operating economics. Architectural decoupling can reduce the effort required for subsequent business and technology change. Enterprises should evaluate each wave against both sides of the transition: the economics of the new AWS environment and those of the mainframe estate that remains. Baseline measures can include run costs, change cycle time, testing and remediation effort, specialist dependency, and retained-mainframe costs. Enterprises should baseline these measures before transformation scales.

Measuring validated modernization outcomes

Enterprises should measure AI productivity when its output becomes usable by the next stage of modernization. Relevant measures can include documentation coverage, dependency accuracy, business-rule acceptance, functional-equivalence pass rates, remediation effort, cycle-time improvement, and human acceptance of generated outputs.

Enterprises should incorporate model and token consumption into the transformation cost base alongside engineering, validation, remediation, and human-review effort. The more useful economic measure is not cost per token or the volume of generated output, but the cost and elapsed time required to produce a validated modernization outcome.

AI can also create value by allowing parts of the modernization life cycle to progress in parallel. Documentation can advance alongside application analysis, business-rule extraction can inform disposition decisions earlier, test design can begin during transformation, and remediation patterns can be reused across waves. The economic benefit comes from reducing rework and elapsed time without weakening controls.

Accounting for different modernization value drivers

The source of value will differ across the estate. Custom-application modernization may reduce maintenance and engineering effort while improving the ability to change business logic. Packaged-estate modernization may create more value through lower customization, easier upgrades, and reduced dependence on bespoke extensions.

Across both, reducing tightly coupled dependencies can create value beyond the initial migration by lowering the effort required for future business and technology change.

Linking savings to actual mainframe reduction

The financial case should capture direct, indirect, and transition costs. Direct savings may include infrastructure, software, support, and incident costs. Indirect value may come from faster releases, better engineering productivity, lower change failure rates, and reduced operational risk.

Enterprises must also account for discovery, tooling, AWS foundation work, integration, testing, training, program management, and dual-run costs. Mainframe savings should be tied to actual decommissioning, capacity reduction, licensing changes, and reductions in support effort rather than assumed when an application moves.

Enterprises should update the business case as evidence improves across early waves and production deployments. Subsequent investment should reflect actual transformation productivity, AWS run costs, transition overlap, and retained-mainframe reduction rather than assumptions made before the estate was fully understood.

The path forward to modernization at scale

As enterprises complete early modernization waves, they need to determine whether the approach is ready to extend across the broader estate. At scale, the test shifts from technical feasibility to repeatability with acceptable risk, effort, and economics.

Early waves should validate the assumptions that matter for scale: the level of automation the program can sustain, the amount of remediation and human intervention required, the viability of the target architecture, and the ability to operate through transition. This is best established through a small number of time-boxed sprints across representative workload types, giving repeatability a measurable basis rather than resting on the outcome of a single successful pilot. Scaling should follow demonstrated repeatability rather than the successful completion of an isolated workload.

Building the capability and ecosystem model for scale

Scaling also reveals whether the enterprise has the capabilities needed to execute the broader modernization program. This is particularly relevant in mainframe environments, where cost and talent pressures continue to influence sourcing decisions. Everest Group research shows that enterprises look externally for capabilities such as scarce mainframe skills, system programming and database expertise, capacity and licensing optimization, and stronger operational knowledge management.

Providers' expectations are also expanding. Enterprises increasingly expect mainframe providers to support resilient operations, cost transparency, hybrid-cloud integration, and modernization of retained and transitioning workloads. AI and automation are gaining relevance as ways to improve engineering and operational efficiency, although they are not yet the primary reasons enterprises select a provider.

Not every modernization program requires a broad external provider. The capability gap should determine the support required. A specific technology requirement may call for a specialist, while product-specific modernization may require OEM expertise. Other activities may remain largely internal.

A broader modernization provider becomes more relevant when the challenge involves coordinating capabilities across multiple parts of the program. Everest Group research indicates growing demand for models that reduce handoffs and bring together mainframe, cloud, AI, DevSecOps, and specialist capabilities.

Where this role is required, provider evaluation should go beyond mainframe experience or AWS credentials. Enterprises should assess whether the provider can maintain continuity from estate understanding through production transition; orchestrate specialized AI agents across discovery, transformation, testing, and remediation; embed human review at critical decision points; and coordinate platform, OEM, and providers' capabilities within a common modernization approach. The provider should also be able to use operational and application evidence to refine modernization decisions as the program progresses.

Providers can differentiate by orchestrating specialized agents, tools, and engineering capabilities as a connected system. Discovery outputs should inform architecture and transformation decisions; generated code should feed structured testing and remediation; validation evidence should inform subsequent waves; and accountability should remain clear as work moves across teams and technologies.

Validating the model before broader rollout

Before committing to broader rollout, early waves should answer five questions:

- Is the approach repeatable? Can similar outcomes be achieved across different workloads without disproportionate increases in effort or remediation?
- Can automation scale safely? Is the level of AI-assisted automation supported by sufficient validation, controls, and human oversight?
- Is the target state operable? Can the transformed environment meet the required performance, resilience, security, and operational expectations?
- Are the required capabilities in place? Are responsibilities clear, capability gaps addressed, and external support appropriately structured where needed?
- Does the value case still hold? Do actual transformation costs, AWS economics, transition costs, retained-mainframe reduction, and future-change benefits support further investment?

Exhibit 4 translates these decision questions into an evidence-led roadmap for determining when and how enterprises should progress to the next stage of modernization.

Exhibit 4: Roadmap for mainframe modernization and scaling

Source: Everest Group (2026)

Is the approach repeatable?	Can automation scale safely?	Is the target state operable?	Are the required capabilities in place?	Does the value case still hold?
Repeatability	Automation safety	Operability	Capability readiness	Value case proof
Comparable outcomes across workloads	Evidence completeness	Performance and latency	Capability ownership	Transformation cost
Effort and remediation trend	Validation and control coverage	Resilience and security controls	Gap closure plan	AWS run economics
Reusable patterns and exceptions	Human intervention thresholds	DevOps and observability readiness	Providers, OEM, and AWS roles	Retained-mainframe reduction
Wave-to-wave predictability	Approved AI outputs	Data and integration coexistence	Production accountability	Transition costs and future-change benefits
Proof points at each decision point determine readiness to scale				
 Validate evidence	 Refine approach	 Deepen discovery	 Close gaps	 Scale next

The answers may lead to different decisions across the estate. Some workloads may be ready to scale, while others may require further validation, a different modernization pathway, or additional capabilities. Early waves should therefore do more than prove that the technology works; they should establish that the modernization approach, target architecture, capability model, controls, and economics can be repeated across subsequent workloads.

Conclusion

Mainframe modernization is ultimately about preserving the capabilities that continue to create business value while eliminating the constraints that limit agility, innovation, and change. Doing this well requires enterprises to understand workload behavior, choose modernization pathways selectively, design explicitly for coexistence, and validate that transformed workloads remain operable and resilient.

AI can accelerate a meaningful share of this work. It can help recover undocumented knowledge, surface dependencies and business rules, and speed selected engineering activities. AWS Transform can contribute to these tasks, but it does not replace architecture decisions, workload-specific tooling, validation, or human judgment. As automation expands, the quality and completeness of the evidence feeding the workflow become increasingly consequential.

For enterprises modernizing toward AWS, success should extend beyond reducing the mainframe footprint or shortening migration timelines. Each modernization wave should leave the estate better understood, less tightly coupled, less dependent on scarce knowledge, and easier to operate and change. A more useful test of success comes later: can the next major business or technology change be handled as normal engineering work rather than requiring another modernization program? This is the test that should anchor the investment case from the outset, not applied at the end of the modernization program. The investment case should ultimately be judged by whether modernization reduces the cost and complexity of future change.

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