

# From legacy to leading edge

Revolutionizing mainframe modernization



## From Legacy to leading edge- Revolutionizing mainframe modernization

Mainframes have long served as the foundation of numerous enterprises, supporting critical operations in industries such as banking, insurance, healthcare, and the government. However, with the rise of modern digital platforms coupled with shifting consumer expectations toward real-time access, and mobile capabilities the need for mainframe modernization has become increasingly compelling. As cyber threats evolve, upgrading outdated systems to meet current security standards and compliance mandates becomes imperative.

The increasing confidence in modernization initiatives and their prioritization as a strategic goal can be attributed to the emergence of modern technologies such as cloud computing, artificial intelligence, as well as innovative architectures. These key enablers offer scalability, resiliency, agility, and cost savings, along with enhanced security and global accessibility. Generative Artificial Intelligence (Gen AI) has revolutionized the modernization of legacy systems, making complex transformations involving legacy code more manageable and cost-effective. Additionally, the adoption of DevOps and automation has fostered a culture of continuous integration and deployment, accelerating business value, migration to modern platforms, and innovation. Collectively, these advancements significantly streamline the mainframe modernization process.

**“Companies are actively seeking AI use cases, and mainframe migration presents a robust opportunity for leveraging AI to drive transformation and modernization.”**

**- Sai Gadia, Partner, KPMG**

# Strategic insights for mainframe modernization: Crucial considerations

Mainframe modernization is a transformative endeavor that can span over 3 to 5 years. There are several key considerations organizations need to keep in mind as they embark on their modernization journey:

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Even well-structured financial plans may overlook important aspects like variable migration scenarios, data migration needs, and ongoing operational costs, resulting in potential cost overruns.”



## 1. Financial considerations

Modernizing mainframe systems requires a substantial financial investment in infrastructure, software, and systems integration. This makes it difficult for organizations to justify the expenditure when the benefits are long-term. Even well-structured financial plans may overlook important aspects like variable migration scenarios, data migration needs, and ongoing operational costs, resulting in potential cost overruns. In our experience, establishing a cross-functional team, engaging finance, early in the process and having a well-defined Return on Investment (ROI) for retiring the mainframe and adopting modern platforms helps realize the project's benefits and ensures a more efficient modernization journey. Increased speed to market for new products and services due to more agile data and infrastructure platforms should be factored when defining the overall ROI business case



## 2. Talent and culture

The modernization of mainframe systems faces significant challenges due to a shrinking pool of professionals skilled in legacy technologies, creating a significant skills gap that can delay projects. Effective transformation requires a diverse set of skills and collaboration across various functions, including business, technology, security, and operations, with expertise in both legacy and modern technologies. Assembling a cohesive and skilled team presents a major challenge, while training new talent is resource-intensive. To streamline the transition, organizations must proactively plan to source and upskill existing personnel, invest in comprehensive training programs, and implement change management initiatives to prepare their workforce.





### 3. Technology and architecture

Mainframes often serve as the central hub for numerous interdependent systems and applications, making modernization efforts complex. The intricate web of legacy components, particularly those written in older programming languages like COBOL, PL/I, and Assembler obscures pathways for modernization. Ensuring the compatibility and seamless integration of new systems with existing applications and data formats is a critical and daunting aspect of this process. In KPMG LLP's (KPMG) experience, establishing foundational technical capabilities such as network connectivity, DevOps processes, containerization, file transfer services, report generation and new tools to support the deliver process early-on assists with efficiency.



### 4. Generative AI paradox

Embracing AI-fueled modernization can significantly enhance and accelerate mainframe modernization efforts. GenAI solutions assist with mainframe code discovery in various ways such as analyzing business rules and data mapping to new target systems, refactoring legacy code, identifying dependencies, generating documentation, predictive analysis and capacity planning. However, AI models can sometimes hallucinate making rigorous testing and validation essential. The adoption of GenAI for code refactoring remains nascent, with current applications focusing mainly on discovery, planning, and documentation. To minimize risks, it is crucial to carefully evaluate vendors, ensure a skilled workforce, and adopt a well-curated strategy that includes a human in the loop.



**Gen AI enabled modernization initiatives require a well-curated strategy, one that brings together a skilled team, the right technology, governance model and strategic human oversight."**





## 5. Service provider engagement

Numerous vendors offer transformation services powered by Generative AI, including automated code translation and tools such as GitHub Copilot and Gemini. These tools can generate target code based on predefined rules, further streamlining the modernization process. However, these technologies are constantly evolving, and many have not been extensively tested, with limited success stories to date.

In response to these challenges, organizations have approached mainframe modernization by developing in-house AI tools to modernize legacy code. Training AI tools on their specific code bases provides flexibility and control, allowing for better customization and alignment with their unique environments. This strategy, however, requires significant resources and expertise.

Alternatively, leveraging third-party vendors offers distinct advantages, including proven methodologies, tools, and practical expertise. A balanced approach that optimizes outcomes can be achieved by combining the benefits of in-house customization with vendor-supported resources and experience. Rigorously evaluating vendor capabilities is crucial to ensure they meet organizational needs and standards.



## 6. Regulatory and compliance

In highly regulated industries, compliance with various standards including data security and privacy is paramount. In our experience, modernization efforts need to ensure that new systems adhere to relevant regulatory requirements and compliance reporting which can add layers of complexity to the transformation journey.



## Art of the possible- How can you be successful in your modernization initiative:

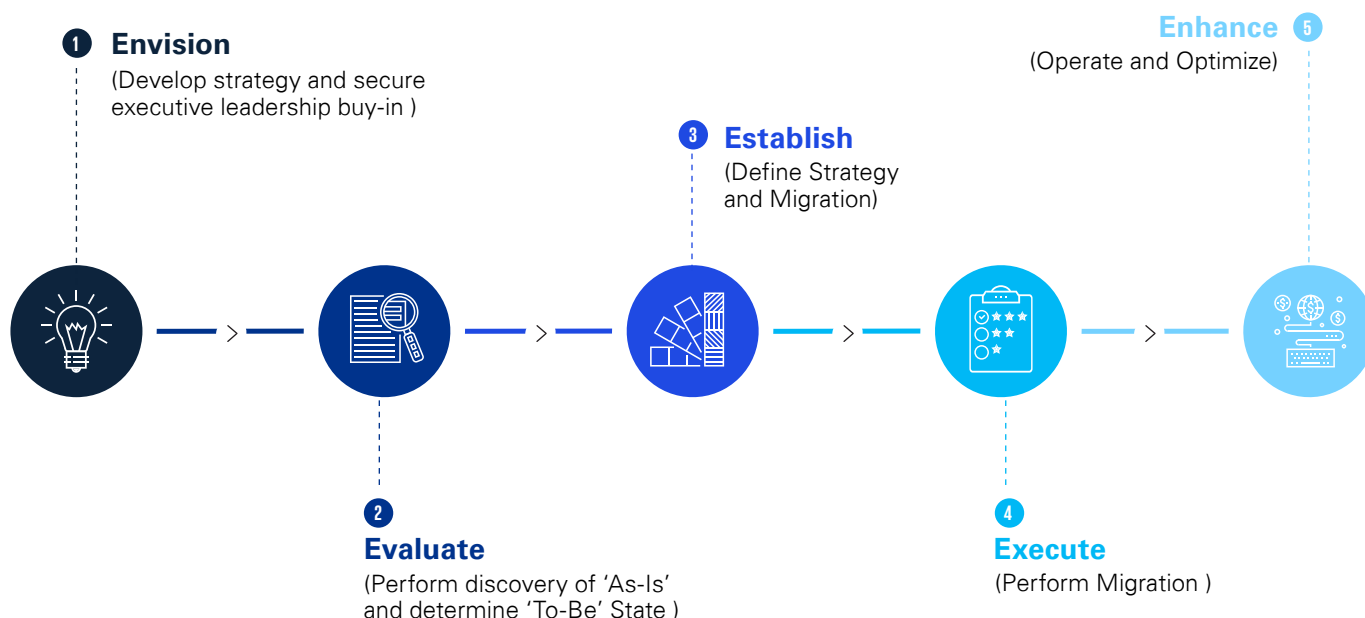
Over the years, organizations have learned through experience that a “big bang” approach to mainframe migration is often ineffective and fraught with risks resulting in cost overruns. Achieving success requires an iterative, agile approach characterized by careful planning, strategic foresight, and a well-defined methodology. A business-led, technology-enabled, and automation-driven strategy can effectively mitigate risks and secure leadership buy-in.



### What can KPMG do for you

Your mainframe modernization deserves more than just a technology update. Our combined expertise in complex transformations, acceleration through use of Intelligent Modernization Toolkit, well-established methodologies, tools, and practical experience delivers lasting results. Our Modernization & Migration Factory approach accelerates our clients’ journey from legacy environments to modern cloud-based platforms, reduces risk, and improves delivery quality. Our approach integrates our Trusted AI framework, which is based on human-centricity, and trustworthiness.

**Here is a high-level overview of our approach to mainframe migrations:**





## ► Transformation strategy:

**Envision: Develop strategy and secure executive leadership buy-in** KPMG helps clients define a modernization strategy aligned with business objectives and future goals. We help assess mainframe landscape, necessary skillsets, collaborate with the right professionals, and help establish a cross-functional team. We also assist our clients in developing a cohesive financial plan, including analysis of initial investment, projected consumption run cost, and exploring alternative funding options.

## ► Transformation Planning and Design:

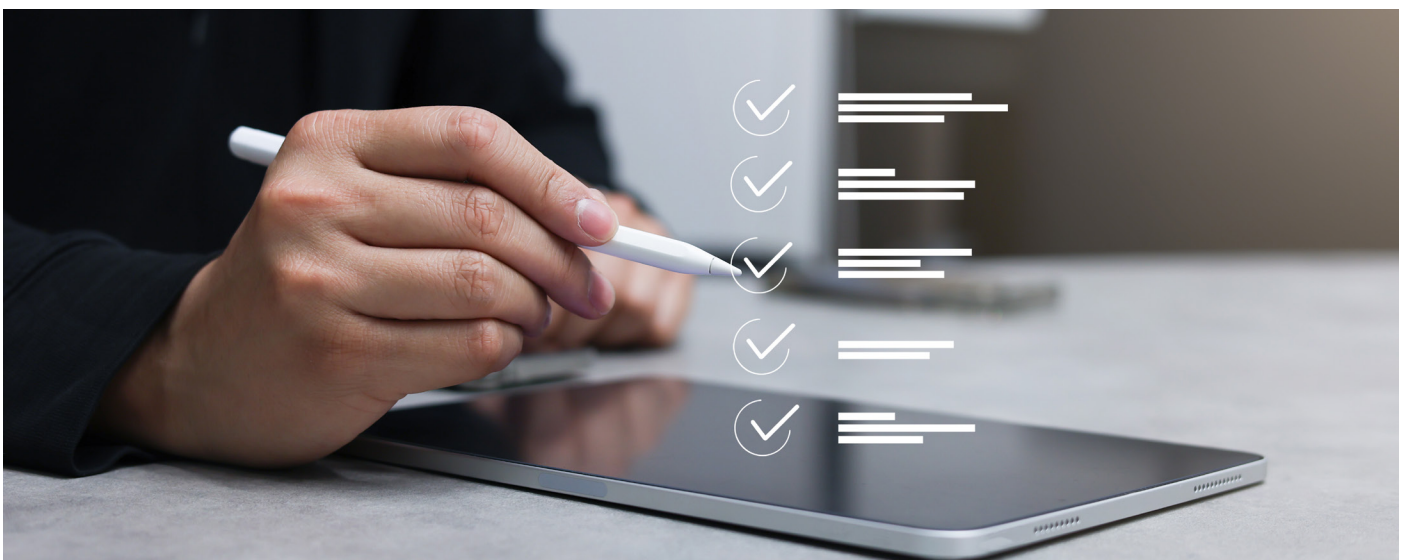
**Evaluate: Perform discovery of 'As-Is' and determine 'To-Be' State** KPMG helps clients create a detailed inventory of applications and components, map interdependencies, review legacy code and data flows. We help our clients design strategic modernization patterns and conduct disposition analysis to select the best migration approach, such as Refactor, Rehost, Hybrid, Repurchase. We also help develop a detailed program roadmap and timeline. Our GenAI enabled accelerators facilitate rapid, economical analysis of your current landscape to enable effective outcomes.

**Establish: Define Strategy and Migration Approach** KPMG helps clients plan the application transformation sequence and create a detailed roadmap. We help clients design the future state architecture and identify hosting platforms, formulate data migration, migration wave planning, security plans, and prepare robust testing strategies. We also help clients mobilize necessary capabilities, develop a solution blueprint, establish target operating model and detailed cost benefit analysis.

## ► Infrastructure Modernization and Application Transformation

**Execute: Perform Migration** KPMG helps clients initiate pilot projects to refine the modernization process, implement automated secure deployment practices, conduct code analysis, refactor legacy code and conduct continuous testing. We also help clients schedule iterative migrations, integrate security measures, and maintain stakeholder communication.

**Enhance: Operate and Optimize** KPMG helps clients implement intelligent, data-driven reporting to support strategic decision-making. We also help clients enhance automation capabilities to improve efficiency. Lastly, we also help transition responsibilities to hyper care support teams and utilize AIOps tools for continuous monitoring and performance optimization.



**We understand the unique challenges of your industry, and our integrated approach helps ensures that your modernization journey will be streamlined, secure, resilient and efficient.**

## Client stories

**#1-** The Capital Markets business of a regional financial services firm with operations in North America, was struggling with developing a technology modernization strategy designed to help the technology organization:

- **Adopt public cloud hosting solutions to become more nimble and more modern**
- **Remediate aging technology in the environment to help reduce operational risk**

KPMG helped this client from the start of their transformation by conducting a current state assessment and developing a technology strategy, performing application disposition aligned to the technology strategy, and then migrating business and infrastructure applications to strategic hosting destinations. As a result, the client is now positioned to aggressively expand their cloud footprint, adopt more modern technology architecture, and take advantage of the organizational and technical agility from a cloud hosting model.

**#2-** A national retailer's efforts to transition from mainframe systems, coupled with past challenges, led to the decision to re-strategize, adopt a hybrid approach to modernize legacy applications, and engage a service provider utilizing AI to facilitate the transformation. However, management had concerns regarding the program strategy, the novelty of the AI-driven approach, and the potential risks and uncertainties involved. These concerns also brought into question the clarity of the migration program's risk factors and cost considerations.

KPMG led a detailed evaluation of the transformation strategy, financial management, mainframe migration methodology, and vendor engagement model provided valuable insights into ways to enhance the current approach, enable better transparency, foster effective engagement and oversight of the service provider, and address risks and considerations related to implementing stronger governance when leveraging AI capabilities.

## Contact us

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